Mental Ill Health- The Effects of Primary, Secondary and Tertiary Prevention Across the Military Deployment Cycle

Jones, Norman Owen

Awarding institution:
King's College London

MENTAL ILL HEALTH - THE EFFECTS OF PRIMARY, SECONDARY AND TERTIARY PREVENTION ACROSS THE MILITARY DEPLOYMENT CYCLE

Submitted by Norman Jones

For the Degree of PhD at King's College London

Contents:

Tables:

Figures:

ACKNOWLEDGEMENTS

I wish to extend my grateful thanks to my supervisors, Professors Neil Greenberg and Nicola Fear for their encouragement and sage advice, without which, the completion of my thesis would have been doubly difficult. Additional thanks go to Professor Sir Simon Wessely and the King's Center for Military Health Team who supported me in various ways and with a special thank you to Margaret Jones who provided excellent supervision and advice along the way while I completed a number of the more difficult analyses. For their help in delivering the rest and recuperation study, I wish to thank Major Mo Fertout QARANC and Dr Laura Parsloe. Mo was also a great help in facilitating the non-deployed help-seeking study. The OMHNE survey team also need some thanks, not only for their assistance in delivering the deployment survey in difficult circumstances in Afghanistan but also for their friendship and good humour. Finally, I would like to send my love to my long-suffering wife Ruth who has not only put up with over three decades of being an Army wife, but has also supported me wholeheartedly while I struggled to pull together the various studies that form the basis for my thesis.

GLOSSARY OF TERMS

Asymmetric Warfare: Warfare in which opposing groups or nations have unequal military resources, and the weaker opponent uses unconventional weapons and tactics, as terrorism, to exploit the vulnerabilities of the enemy.

Brigade: A subdivision of an army, made up of different sized sub-units with different military roles. A Brigade typically consists of around 5000 personnel.

Chain of Command: The chain of command is made up of leaders with varying levels of seniority and responsibility, from those with overall day to day command and control of the Army, Royal Navy and Royal Air Force through to battalion leaders (~600 personnel), company leaders (~120 personnel), platoon leaders (~35 personnel) and section leaders (8 personnel).

Combat Medical Technician (CMT): CMTs are army personnel who provide medical support to deployed military personnel. They have advanced first aid skills through to advanced medical skills normally associated with the paramedic role. They deploy alongside the infantry providing direct combat support and also provide medical support in depth through to the point where injured personnel are evacuated from the theatre of operations. The RAF and Royal Navy have personnel in similar roles with different titles.

Counter-Improvised Explosive Device Task Force (CIED-TF): The C-IED TF is made up of small teams comprised of personnel with various roles whose activities include searching for, destroying or recovering IEDs for intelligence, generating counter-measures and forensic purposes.

Check Point (CP): A facility established in an operational area that can be semi-permanent or transitional which is used by personnel to mount forward patrols in tactically important areas.

Deployment: Undertaking military operations, most often overseas, for lengths of time up to six months. Deployment missions can take the form of peace making, peace support, peace keeping through to combat operations. They can sometimes incorporate humanitarian missions.

Forward Operating Base (FOB): Forward operating bases are areas where military personnel mount operations in a distinct area within the overall area of operations. FOBs are usually medium sized and provide a transitional logistic support facility between main operating bases and patrol bases.

Formed Unit (FU) Personnel: Personnel who deploy as part of a unit which exists in peacetime and transitions into an operational area. FU personnel usually deploy with peers, colleagues and friends.

Forward Deployment: This is a term applied to conducting missions in austere, dangerous areas.

Forward Psychiatry: This term relates to psychological therapy and treatment carried out in the operational area where mental health support is delivered as close to the operational unit as possible using the principles of PIES (see below).

Harmony Guidelines: Harmony Guidelines are the guidelines which state how long military personnel should be deployed within a given timeframe. Although there are small differences in how Harmony duration is calculated between the three branches of the Armed Services, the guidelines generally state that individuals should not exceed around 13 months of cumulative separated service in any continuous period of 30 months.

IAPT: Improving Access to Psychological Therapies (IAPT) is an NHS programme of talking therapy treatments recommended by the National Institute for Health and Clinical Excellence (NICE) which support frontline mental health services in treating mainly depression and anxiety disorders.

Individual Augmentees: IAs are those personnel who deploy alone or with small numbers of other military personnel rather than formed unit personnel who deploy with known members of their peacetime unit.

Married Quarters: Living accommodation provided by the UK Armed Forces for personnel who are married or who are in civil partnerships.

Military Occupational Fitness: All military personnel have a medical grading which determines their ability to deploy. The categories are, not deployable, deployable with limitations, fully fit for deployment and medically unfit for military service. Military grades are awarded and administered by a military doctor.

Main Operating Base (MOB): The main operating base is a large base area within the overall area of operations which acts as the main logistics hub.

OROSM: Overarching Operational Stress Management. This is an inclusive process that sets out the activities that must be put in place from point of entry into the military through to support immediately post-discharge from the Armed Services.

Overstretch: Overstretch is a colloquial term applied to the activity of breaching the guidelines for the maximum time that military personnel can be deployed within a specified period of time.

Patrol Base (PB): A patrol base is a semi-permanent or transitional location which sits between check points and forward operating bases. As the name implies, it is used to mount patrols into tactically important areas. Patrol bases usually support a number of check points.

PIES (Proximity, immediacy, expectancy, simplicity): Proximity, mental health treatment close to the combat area, immediacy, treatment conducted as soon as possible after the point of breakdown, expectancy, the expectation that personnel will return to their operational unit following treatment, simplicity, keeping any intervention as simple as possible.

POSM: Post operational stress management is comprised of a series of processes that take place after a person has been deployed. It starts with third location decompression, then a period of normalisation and post-deployment leave, and a commander-led interview twelve weeks post deployment. Mandatory psychoeducational briefs take place during decompression and are repeated during the return to steady state.

Rank: Military ranks are a system of hierarchical relationships in Armed Forces. Usually, uniforms denote the bearer's rank by particular insignia affixed to the uniforms. In the UK Armed Forces, commissioned officers have ultimate command responsibility at two levels; senior and junior.

Rest and Recuperation (R&R): Personnel deploying for six months or more receive a single continuous 10 day period of rest and recuperation (R&R) at some point during their deployment. The stated aim of R&R is to 'provide those who have been mentally and physically challenged by continuous service, usually in an operational area, time to rest out of the line and 'recharge their batteries' in order to sustain operational effectiveness'.

Third Location Decompression (TLD): TLD is a post deployment activity which has become a mandatory process for the majority of military personnel who have taken part in operational deployments. TLD aims to allow military personnel to begin to psychologically 'unwind' after operational deployment through the provision of a brief period of structured rest. Currently, for UK AF personnel, TLD is conducted in Cyprus, the 'third location'. TLD aims to ensure that formed unit (FU) personnel who have deployed together are able to unwind together, the

rationale being that it enables individuals to make use of support from their peers in a neutral and stress-free setting.

United Kingdom Armed Forces (UK AF): The three Services which comprise the UK military are known as the UK AF and are composed of the Royal Navy, including the Royal Marines, Army and Royal Air Force.

Welfare Support: The general support delivered to military personnel which aims to maximise their mental health and social wellbeing. It is a command responsibility and authority for welfare support delivery is usually delegated to a senior person within the military unit.

ABSTRACT

Primary, secondary and tertiary prevention of mental ill-health among UK military personnel was evaluated pre-, during and post-operational deployment. Primary prevention studies examined whether rest and recuperation taken during deployment promoted better mental health (n=536). R&R was highly satisfying but did not promote better mental health. Psychological benefits occurred only when R&R was used to mentally disengage from operations and to access social support. Mental health outcomes were compared in a sample of personnel attending a brief structured post-deployment rest period (Third Location Decompression or TLD) (n=1407) and non-attendees (n=1664). TLD attendance benefited mental and physical health, reduced alcohol misuse following deployment, but had no demonstrable effect upon transition from operations to the peacetime environment. Psychological effects were related to levels of combat where greater combat exposure was associated with reduced TLD benefits. Primary and secondary prevention activity was assessed during deployment (n=2794). Receipt of pre-deployment psycho-education, experiencing good leadership and satisfactory support for families were associated with substantially better deployment mental health. Medical consultation for a physical condition was associated with poorer mental health, suggesting that mental ill-health detection might take place during medical consultations. Secondary prevention was assessed pre-deployment (n=484) and post-deployment (n=1636). Greater mental health stigmatisation was associated with reduced help-seeking. Changes in psychological symptom levels were associated with synchronous fluctuations in stigma levels. New mental disorder caseness and remission from caseness were both associated with significant increases and decreases in stigmatisation respectively. For tertiary prevention, mental healthcare delivered during operations (n=611) returned around 75% of personnel to full operational duties. Over a four year

follow-up period, around a third of study participants were consistently unfit for deployment. Pre-deployment clinical care (n=2979) returned around 75% of personnel to full duties; during prolonged follow-up, around 33% of personnel experienced reduced occupational fitness. Recommendations for improving current mental ill-health prevention practices and avenues for future research are described.

Contribution of the Author and Other Researchers

1. **R&R Study** I developed this study with two co-researchers. I provided logistic support for the initial interview and pilot phase of the development of the R&R experiences scale and provided ongoing advice about both the structure and content of the scale and the survey in which it was embedded. I played an active role in the revision and compilation of the final scale. I played a major role in collecting and cleaning the study data and I am solely responsible for transforming the dataset and the subsequent analyses. I collaborated with colleagues to produce a short academic paper for which I was first author and which was published in The Journal of The Royal Society of Medicine and I am solely responsible for the chapter as it appears in the thesis.

2. **Third Location Decompression (TLD) Study** I was not directly involved in the design and data collection element for phase one of the KCMHR cohort study from where the TLD dataset was drawn. I was however part of the team that designed the phase two questionnaire and acted as a military advisor during the data collection phase, the collation of the final dataset and I contributed to the journal submission describing the general findings arising from the cohort study. I developed the dataset for the TLD study from the cohort dataset myself with advice from my supervisors. I am solely responsible for the analyses and the production of the chapter. I was first author of a short academic paper describing the findings which was published in the Journal of Occupational and Environmental Medicine.

3. **Operational, General, Welfare and Medical Support** This thesis component was based upon two pieces of research. I had a major role in the development and implementation of the

first operational mental health needs evaluation (OMHNE) study conducted in 2010 and I was the team leader solely responsible for the development of the study protocol and collection of the second dataset in 2011. I carried out the provisional analyses of the second of the operational datasets compiled in Afghanistan and wrote an internal report based upon the outcomes. I was solely responsible for the amalgamation of the datasets, the subsequent analyses and was first author of a paper detailing the results which was published in the British Journal of Psychiatry. I subsequently wrote the thesis chapter.

4. **Non-deployed Stigma and Help-Seeking Study** I played a major role in the development of the data capture tool used in the stigma reduction comparative study from which the non-deployed help-seeking study is derived. I collected the completed surveys, entered and cleaned the dataset. I developed the study hypotheses, aims and objectives and I undertook the secondary analyses with advice from my supervisors. I produced a short academic paper based upon this study which was published in The Journal of Psychology and Psychotherapy. I am solely responsible for the chapter as it appears in the thesis.

5. **The Post-deployment Stigma Study** With my supervisor and other team members, I formulated and helped in the original RCT study design from which the thesis chapter dataset is derived. I then assisted the study coordinator in designing the materials used in the study, in delivering the intervention and finally assisting with data collection. The content of the chapter is solely my own work. I carried out all of the secondary analyses and wrote the text.

6. **Deployed and Non-deployed Clinical Studies** I led the development of the data capture tool used for both the operational and non-operational clinical studies, compiled the datasets, performed the data linkage, carried out the analyses and wrote both chapters.

7. I am solely responsible for compiling writing and editing the remaining chapters of the PhD thesis.

CHAPTER 1 - THE MILITARY DEPLOYMENT CYCLE AND THE PREVENTION OF MENTAL ILL-HEALTH

Primary, Secondary and Tertiary Prevention – Definitions and Descriptions.

This thesis is concerned with the promotion and maintenance of mental health among UK military personnel. The conceptual model within which the various mental health interventions are embedded is characterised by three levels of preventative activity. Progression from mental health to mental illness is disrupted and/or reversed by targeted activity at each level of prevention.

Primary Prevention (*Prevent*)

Primary prevention is mostly concerned with averting mental breakdown through activities such as risk reduction or building resilience. This can be a passive process, where general strategies or policies are applied at a population level to deal with specific risks, while active practices require behaviour change by individuals. Primary prevention is principally the responsibility of line managers who develop and implement organisational strategies under the direction of senior managers who set out rules and policies; healthcare professionals further assist in the promotion, development and evaluation of their efforts (Arends et al., 2010).

Secondary Prevention *(Detect)*

Secondary prevention is concerned with the identification of the early signs of mental health disorder so that by timely effective intervention, further progression or worsening of symptoms and problems is inhibited and normal daily living is maintained (Arends et al., 2010).

Tertiary Prevention *(Treat)*

Tertiary prevention is mostly concerned with providing timely and effective treatment for those suffering with established mental health disorders to return them to full fitness or to minimise long term disability (Arends et al., 2010).

The Potential Adverse Impact of Reduced Occupational Fitness and Restorative Interventions

The adverse personal impact of reduced occupational fitness arising from mental ill-health symptoms is potentially considerable and impaired health appears to have a substantial negative effect upon productivity and financial health at an organisational level. The UK economic burden of workplace ill-health is thought to be sizeable, with one study estimating the combined annual cost of lost productivity and sickness absence payments to be £100 billion (Layard et al., 2007; Sainsbury Centre for Mental Health. 2007; Black, 2008; SAMH. 2011). The overall fiscal consequences of sickness absence aside, the personal burden of reduced workplace psychological wellbeing and associated absences can be devastating and far reaching. While occupational impairment has a range of adverse mental health consequences, productivity at work appears to be good for both mental and physical health (Waddell, 2006, Claussen et al., 1993, Department of Work and Pensions. 2010). With this in mind, a range of processes have been devised to promote presenteeism, however, achieving optimal workplace mental health is a complex undertaking with well-intentioned interventions often producing variable outcomes at best (Harvey et al., 2009). The problem of reduced occupational fitness has been deemed to be such

an important and widespread phenomenon that the National Institute for Clinical Excellence (NICE) (NICE, 2009) has developed public health guidance for achieving improved occupational mental wellbeing. In addition, the IAPT programme (Improving Access to Psychological Therapies) is a UK government backed initiative intended to reduce the personal and economic burden of psychological illness through the facilitation of effective self-management and the engagement of affected people with evidence-based therapy (de Lusignen et al., 2012; NICE. 2009). Although published outcomes are somewhat sparse, recent studies suggest that at least half of those treated within IAPT arrangements achieved pre-defined criteria for recovery (Chan and Adams,2014); fiscal benefits related to implementing IAPT have yet to be clearly demonstrated, though some studies suggest a marginal positive financial effect (Mukuria et al., 2013). A meta-analysis suggested that functionality at work might be improved for those with symptoms of common mental disorder through the provision of timely access to high intensity interventions delivered within the workplace with the intention of arresting or reversing symptom deterioration (Pomaki et al., 2012). The available data, therefore, suggest that delivering workplace mental health support is feasible and although the evidence for effectiveness is not strong, that some personal and organisational gains may result from having structured interventions and strategies in place.

Military Occupational Mental Health

The main purpose of the United Kingdom Armed Forces (UK AF) is to undertake worldwide operational deployments to protect the nation and its dependent territories against threats to its security and national interests (Ministry of Defence, 2011). Military deployment can take the

form of fighting wars where combat exposure is thought to be the main psychological threat (Cigrang et al., 2014). Counter-insurgency (COIN) operations are different in character to war-fighting and are said to require a unique mindset of military personnel due to the asymmetric nature of the enemy threat (Kiszely, 2006). Various forms of peace-keeping and peace support operations encompass distinctive exposures such as humanitarian interventions and both can be associated with the development of common mental health symptoms for some participants (Hotopf et al., 2003, Greenberg et al., 2008). In order to embark upon military operations, UK military personnel undertake a progressive series of phases or steps. The 'deployment cycle' describes the process through which personnel prepare for deployment, undertake operations and then return home. Deployment therefore has three discrete phases; preparation, which is characterised by training and entry into a high readiness state; deployment, where military personnel undertake operations lasting from one month to one year, most commonly between three and seven months duration and post-deployment recovery, recuperation and return to steady state. Although the psychological consequences for military personnel undertaking operations are increasingly well documented, the effectiveness of the various preventative measures used by UK AF to support the mental health of military personnel while they navigate the phases of deployment is less well understood. Given that prevention is preferable to intervention when a disorder has developed, the UK AF utilise a broad prevention strategy described as 'Overarching Operational Stress Management' (OROSM) (Ministry of Defence, 2004, Ministry of Defence, 2005). This programme has six distinct steps:

1. Working with pre-service beliefs and attitudes during recruit training.

2. Stress management strategies taught during in-service developmental training and promotion courses undertaken for career progression.

3. Pre-deployment mental health support and interventions.

4. Psychological support delivered to military personnel while they are deployed.

5. Post-deployment recovery interventions.

6. The maintenance of good mental health following discharge from the Armed Forces.

Attempts are made at each stage to prevent mental ill-health, to detect its precursors and to treat those personnel who develop mental disorder as a result of their military service.

Occupational Fitness in the United Kingdom Armed Forces

The UK AF are a comparatively small organisation with finite human resources. Although it is constantly reducing, the combined strength of the Royal Navy Army, and Royal Air Force was 152440 in 2014 (Defence Statistics, 2014), occupational fitness and associated deployment readiness among individual Service members is crucial to maintaining an effective fighting force. Military personnel are often asked to engage in demanding, dangerous and potentially traumatising work that has been linked to adverse mental health outcomes for some (Sundin et al., 2014; Hoglund et al., 2014), particularly among those sustaining battle injury (Heltemes et al., 2014); workplace mental health support is therefore a potentially important way of maximising workforce hardiness (Barnes et al., 2013).

All employers who knowingly place their employees in harm's way have a moral obligation to enhance workplace wellbeing whilst complying with legal requirements (Tehrani, 2002). For mental health, this is often achieved by providing psychological support systems and processes.

Hardiness, that is, good mental health in the face of adversity, is a desirable characteristic among military personnel and some evidence suggests that it might be partly innate (Orme et al., 2014), though some empirical data suggests that it might be promoted by specific psychological interventions such as through the provision of mindfulness-based practices delivered in the workplace (Johnson et al., 2014). In the field of mental health, interventions are complex and rarely risk-free; inculcating psychological 'toughness' for instance may have unintended negative consequences in terms of higher rates of mental disorder symptoms among those endorsing greater levels of toughness. Some evidence suggests that tough individuals can operate to a high level while harbouring substantial mental ill-health symptoms. (Jakupcak et al., 2014).

A Prevention Model

The World Health Organization defines mental health as 'a state of well-being in which every individual realises their potential, copes with the normal stresses of life, works productively and makes a contribution to their community' (World Health Organization, 2014). This definition is thus not merely about the absence of disease or infirmity, but rather encompasses a range of positive behaviours and outcomes. To achieve optimal mental health, a well-established public health preventative medicine process uses primary, secondary and tertiary prevention strategies

to intervene in and minimise the effects of a wide range of both physical and mental health disorders (Bloom, 1979). Although conceptualised as having three well-defined categories, in practice, preventative interventions may not be unique to each level of the model and often cross blurred boundaries (Vicary, 1994). Preventive measures in mental health disorders are not only relevant before conditions take hold, but can be introduced at any stage of development in order to arrest or retard progression.

Promoting Occupational Fitness in Military Settings

Much of the available research has been conducted among civilian cohorts and on a cautionary note, although this may be equally true of civilians, outcome data suggest that military personnel appear to be rather difficult to engage in structured mental health support or therapy and may have difficulty adhering to treatment (Hoge et al., 2014; Kim et al., 2010; Brewin et al., 2011; Garvey Wilson et al., 2009). Because of differences in the way that the UK AF are structured compared to the majority of civilian organisations, being rigidly hierarchical, and the prevailing attitudes to receiving external support, where self-reliance and hardiness are much prized (Bartone et al., 2013), the approaches that may be successful in a civilian context may require modification if they are to be effective in military settings.

In addition to specific workplace-based interventions to promote occupational fitness, there may be some psychological benefits to be gained from ensuring that routine military training acknowledges and incorporates mental health support principles so that mental health literacy and symptom recognition is improved. The preparation of military personnel to deploy and

undertake combat missions enshrines the key principle of tough, realistic training. Over and above the potential psychological benefits of increased physical fitness, there may be a direct benefit to be gained from simultaneously acquiring self-management strategies that may help to offset the development of mental health disorders resulting from adversity (Figureley and Nash, 2006). Challenging pre-deployment training seeks to promote a sense of cohesion that encompasses mutual reliance between individuals and aims to foster important group processes such as social support (King, 2013). Meaningful social support in particular has been cited as being crucial in helping people to be resilient and overcome the potentially negative psychological effects of exposure to potentially traumatic events (Ganster and Victor, 2011). Some have argued strongly that the most meaningful psychological support for military personnel is best achieved, as military doctrine often states (Mora,. 1967) by promoting group cohesion and morale while others advocate the use of empirically derived preventative or supportive interventions. The latter approach encompasses activities such as pre-deployment psycho-educational briefing (Greenberg et al., 2009). Other forms of intervention are those derived from systems with a broad evidence base such as stress inoculation training (SIT) (Meichenbaum and Cameron, 1989), which is a highly structured, exposure-based training approach that appears to have some utility when conducted as a pre-exposure measure (Flanagan et al., 2012; Hourani et al., 2011; Hourani et al., 2012).

More recently there has been a drive to develop complex multi-component strategies based upon resilience building, such as the comprehensive soldier fitness (CSF) programme (Casey, 2011) currently being implemented widely in the US Army (Lester et al., 2011[a]). The CSF programme attempts to capture all hypothesised aspects of resilience, extends to a spiritual component

delivered via a web-based package (Pargament et al., 2011) and includes a Global Assessment Tool (GAT), which is a self-report survey measuring psychosocial fitness in emotional, social, family, and spiritual domains (Peterson et al., 2011). The CSF is an example of a well-intentioned psychological intervention that has been delivered to substantial numbers of personnel with little or no pilot testing or early evaluation of its effectiveness. Although non-peer reviewed, technical reports give early indications that certain programme components may be potentially effective (Lester et al., 2011[b]). However as some commentators suggest, unless it is systematically evaluated, it may yet transpire that CSF has unintended adverse consequences, perhaps including iatrogenic effects (Steenkamp et al., 2013).

Some evidence for the effectiveness of non-specific group level intervention to promote mental fitness has been published; effective leadership style (Davidovitz et al., 2007), high levels of cohesion (Brailey et al., 2007) and improved morale (Lapierre et al., 2007) have all been shown to have positive mental health benefits. In addition to directly impacting upon mental health, leaders may play an important role in fixing the broken. In order to maximise mental health, treatment may sometimes be necessary and effective leaders appear to be able to promote a greater willingness to access psychological services when symptoms of mental disorder are present (Wright et al., 2009).

During deployment, UK AF provide a variety of support measures which aim to minimise the potential negative effects of undertaking combat operations. At a primary prevention level, these include family support for loved ones at home and welfare interventions. During deployment, an central component of psychological wellness is related to the social support provided to the

service member by families at home in the form of communications, be they by telephone, letter, care package (Carter et al., 2011) or digital means (Lewandowski et al., 2011). As is often the case with all forms of mental health support, a cautionary note is probably required. Despite the best efforts of loved ones to support the military person throughout their period of deployment, communication with home can sometimes have disastrous effects (Greene et al., 2010), for instance when the consequences of problems occurring at home are communicated to the deployed person (Mulligan et al 2012; Erbes et al., 2008) who may well be powerless to intervene or help.

In addition to welfare support, medical services are made available across the spectrum of deployment in an attempt to provide a consistent approach to promoting mental health through primary and secondary prevention and allowing access to therapy services. Throughout their military careers, commanders receive instruction which aims to ensure that they facilitate access to available support, including therapeutic intervention, for those in their care. It is hoped that, by feeling supported by their commanders and peers, help-seekers will not perceive that they are prejudiced in any way for having declared a potential mental health problem. Additionally, commanders are required to ensure that psycho-education is made available at key points in the cycle of deployment. Stress briefings are a component of a comprehensive system of stress management which are delivered pre-deployment, immediately post-deployment and during leadership courses throughout the military career (Ministry of Defence, 2004). In a military context, facilitating timely access to medical and welfare support, colloquially known as 'signposting', is fundamental to effective leadership. As well as facilitating access to support, prior research suggests that leaders are pivotal in promoting morale and unit cohesion, which in

turn can be associated with psychological health (Jones et al., 2012). The spectrum of deployment support is undoubtedly well intentioned; however, research suggests that some components of welfare and medical intervention have positive but somewhat marginal effects upon mental health (Greenberg et al., 2012; Jones et al., 2013).

Regulating Military Occupational Fitness among UK Armed Forces Personnel

To effectively manage military occupational health, a system of medical classification (Ministry of Defence, 2006) allocates medical employment categories to individuals which govern the way in which they deploy on operations or are debarred from doing so according to the overall impact of their current health. Broad categories of deployment restriction are assigned to personnel (fully deployable, limited deployable and not deployable) so that the person is protected while their illness or mental disorder is managed effectively. For some personnel, discharge from the UK AF is arranged on medical grounds when the restrictions are enduring and are such that the person cannot be employed in any military capacity (Ministry of Defence, 2007). The rate of medical discharge varies over time, between Services and by military role.

CHAPTER 2 – LITERATURE REVIEW

The preceding chapter detailed the stepped prevention model as it is applied to the promotion and maintenance of mental health among military personnel. Although the prevention model was generated for use in a variety of non-military occupational and healthcare settings, the extent to which it has been evaluated in a military context is largely unknown. The discussion laid out in the previous chapter suggested that various unique aspects of military service and military healthcare arrangements might impact on how prevention activity is delivered within military organisations. A literature review was therefore conducted to assess the extant literature relating to prevention activity within various international military forces.

While carrying out the literature review process it was apparent that, in relation to mental health, there is potentially a great deal of activity in the three areas of prevention which may not have been captured by the search strategy. 'Mental health' was one of the main search terms; adding the terms 'psychological', 'mental and illness' and 'mental and disorder' either in full or truncated form did not increase the number of articles retrieved. When the search was limited to military personnel, few studies purport to examine primary, secondary and tertiary prevention, rather, with a limited number of exceptions, studies were often titled according to the specific area of enquiry rather than being categorised as a preventative activity. In addition, few abstracts used the primary, secondary and tertiary prevention nomenclature. This was particularly true for tertiary prevention where clinical studies predominate.

The Literature Review

A literature review of preventative measures for promoting mental health among military personnel was carried out. The literature search was initially conducted in April 2012 at the outset of the period of PhD study and was updated in February 2015 using the electronic databases, MEDLINE and EMBASE with PubMed, OvidSP and ISI Web of Knowledge search engines. The search was limited to human adult subjects. Freetext terms were used with Boolean operators. The search terms and number of candidate articles retrieved at each stage of the search were:

Serial	Search Term	Number
1.	Mental Health	456381
2.	Military	161511
3.	Prevention	1223512
4.	1 AND 2	7032
5.	1 AND 2 AND 3	503

Exclusions

All abstracts relating to preventative mental health measures among military personnel were eligible for full-text review (n=503). Exclusion criteria were applied to limit articles to the study area. An initial screen of identified abstracts and titles was conducted and articles were eliminated if they were not directly related to primary, secondary and/or tertiary prevention within the field of military mental health. Articles relating to suicide and self-harm were

excluded as suicide has a low prevalence among UK AF personnel (Pinder et al., 2011), is not always associated with mental disorder (Hines et al., 2013) and was not a central pillar of this thesis. Family studies were excluded as the search was intended to explore prevention activity as it relates to military personnel located at various points of the deployment cycle not their families. To ensure that candidate articles were of sufficient quality to justify inclusion in the literature review, opinion and editorial articles, books and book chapters, proposed programmes of research and case studies were excluded unless the publications contained descriptions of data derived from pilot or test phases. The exception was when a review constituted expert panel opinion or was a Delphi study design. Original papers containing descriptions of outcome studies, systematic reviews and meta-analyses were included. Mild traumatic brain injury (mTBI) research was excluded as this is a controversial area (Nelson et al., 2015) that is beyond the scope of the current research. Although alcohol misuse was included and comprised a small number of the candidate articles, substance misuse was excluded as it is a prevalent offence in the UK AF which invariably meets with discharge from the Services on disciplinary grounds and is not subject to preventative measures in the manner of alcohol-related and mental health disorders. Veteran studies were excluded as the thesis relates specifically to serving personnel. The itemised exclusion criteria and the number of excluded articles are shown below**:**

Exclusions	**n**
Suicide	93
Families	52
Proposed Studies	7
Reviews or Books	102
Mild Traumatic Brain Injury	13
Veterans	22
Substance Misuse	5
Case Study	2
Duplicates	120
Military Sexual Trauma (MST)	4
Low Relevance	44
Total	**464**

Following the application of exclusion criteria, 39 candidate articles remained. The reference lists of the articles were subjected to a secondary search, as were relevant citations contained in articles generated by the secondary review. 126 articles were identified as being relevant to the literature review, giving an overall total of 165 candidate articles.

The following discussion is related to the three areas of prevention, primary, secondary and tertiary which are dealt with in turn.

Primary Prevention (*Prevent*)

Military Sub-groups

The literature suggests that the primary prevention of mental health disorders may have to take account of special populations which might arguably include the military. Although general prevention may be useful for most occupational groups, interventions may be required that are tailored to the unique needs of occupational groups with specific characteristics such as high levels of potentially traumatic exposure, high levels of risk or other workplace stress (Sajatovic et al., 2010). Some research suggests that some military sub-groups may require modified forms of preventive activity. For instance, prevention activity may need to take account of the distinctive needs of certain sub-categories of military women. Deployed US servicewomen who experienced combat or who reported high levels of deployment stress were found to be at greater risk of reporting mental health conditions compared to men with similar exposure (Seelig et al., 2012). This is a theme that appears to run through the literature and suggests that a 'one size fits all' approach to prevention may not be the best policy for military personnel.

The Use of Technology

A comprehensive exploration of the activities of deployed US mental health support personnel in Iraq revealed that common primary prevention interventions included the provision of psycho-educational classes (n=3,900), traumatic event-related interventions (n=535), command directed mental health evaluations (n=750), while casual walkabout face-to face contacts were substantially more frequent than any other form of activity (n=80,400) (Hung, 2007). While opportunistic face-to-face mental health contact such can be exploited for prevention purposes,

developments in the field of telemental health could potentially expand the numbers of personnel who might benefit from primary prevention during deployment. An expert panel concluded that technological advances could be used to support activities such as stress inoculation training and could potentially promote social connectivity among deployed personnel with psychological symptoms (Spira et al., 2010). Emerging evidence suggests that mental health-related stigma reduction might be achieved through specific CBT-based coping skills and peer-to-peer support could be facilitated when it is delivered or hosted using a web-based platform (Van Voorhees et al., 2012).

Early Career Interventions

Although not directly relevant to the thesis subject matter, primary prevention has been used early in military careers to increase the proportion of trainees completing initial training. At the US West Point Academy, where prospective US military officers receive schooling and pre-service training, cadets seeking support for mental health problems, those hospitalised with physical illness and those tendering resignation received increased levels of mentoring. Consistent application of the principles of primary and secondary prevention appeared to be effective in reducing the rate of resignation among those with potential psychological symptoms (Conrad et al., 1976).

Physical Interventions

Prevention programmes have incorporated physical interventions which may have an indirect mental health effect, for instance improving physical health and fitness to maximise mental health among military personnel (Gubata et al., 2013). Other treatments with no obvious mental

health features have been shown to be of psychological benefit. In a study of combat injured personnel, early morphine administration during trauma care appeared to promote better mental health by significantly reducing the risk of developing PTSD during rehabilitation (Holbrook et al., 2010).

Psycho-education-based Approaches to Prevention

As noted by Sandler et al. (2014), across the articles included in this literature review, the margins of effectiveness for primary promotion in particular can be quite small, although when primary preventative measures are integrated into an overall strategy, they may have a more profound cumulative effect (Barrett et al., 2001). Prevention strategies sometimes use welfare-based or supportive managerial approaches in an effort to increase resistance to the development of mental health disorder. There is some precedence for adopting such approaches; in a study of 12,756 US military personnel deployed worldwide, higher levels of general stress in the workplace were statistically significantly associated with higher rates of mental health symptoms and productivity loss. The authors argued that primary and secondary prevention efforts should target individuals experiencing general subjective work-related stress in order to identify and access those who require definitive mental health support (Hourani et al., 2006). The UK AF often make use of group level measures to promote resistance to stress. In preparation to undertake military operations, pre-deployment training incorporates a wide range of military activities and training designed to maximise deployment readiness. At a point just before deployment, a mandated primary prevention strategy includes the provision of psycho-education. In the military context, psycho-education seeks to promote self-help for lower level distress and encourages timely help-seeking in the case of unremitting symptoms or mental disorder (Murphy

and Sauter. 2003). Education-based approaches often span primary, secondary and tertiary prevention levels (Gordon, 1983). Self-help is a common alternative to formal help-seeking and is often a reflexive response to indicators of deteriorating mental health (Morin et al., 2006). When submitted to rigorous evaluation, the provision of self-help in the form of written educational materials has been shown to have equivocal (Ehlers et al., 2007; Scholes et al., 2007) or even negative effects (Turpin et al., 2005), however, providing a self-help manual with some therapist assistance fared moderately well when used to self-manage depressive symptoms (Williams et al., 2013). It is perhaps inevitable that some personnel will develop psychological problems despite adequate pre-deployment preparation; this may be related to overwhelming levels of combat exposure during the subsequent deployment (Rona et al., 2009) or the effects of non-combat operational factors such as witnessing atrocities within a peacekeeping context (Sareen et al., 2007). A continuously evolving, evidence-based approach to early preventative intervention is therefore necessary.

In an attempt to improve their effectiveness, psycho-education-based interventions have been incorporated into multi-component strategies. The Defender's Edge (DEFED) programme was grounded in a strengths-based philosophy and was delivered by a psychologist embedded with US Special Forces (SF) personnel. The programme was based upon two assumptions, firstly, SF personnel are inherently resilient and healthy and secondly, that combat is not a risk factor, but is akin to a challenging athletic event. The programme was delivered in five educational modules included fatigue countermeasures (sleep hygiene, stimulus control measures and limiting caffeine use), adrenaline management (stress management, relaxation and mindfulness measures), mission focus (goal-setting, identifying clear values, accepting adversity and cognitive restructuring), controlling responses to killing (cognitive restructuring, cognitive

flexibility and grief work) and mind tactics (social support, cognitive restructuring and distress tolerance). 192 participants reported that embracing the programme messages and contact with the psychologist in particular helped them to challenge mental health-related stigma (Bryan et al., 2011). However they are structured, engagement with preventative strategies on the part of the recipient is arguably the single most important determinant of successful outcome. Among 782 soldiers taking part in post-deployment resilience training, positive endorsement of two factors reflecting attitudes to training content and engagement with the training process were linked to improved mental health-related attitudes and positive changes in mental health six months after programme participation (Foran et al., 2012).

Warrior Resilience Training (WRT) is a multi-component, education-based resilience intervention which sought to promote posttraumatic growth among US Army personnel deployed to Iraq. The intervention used a combination of rational emotive behaviour therapy (REBT), a variant of cognitive behaviour therapy, leadership principles and positive psychology. Feedback from 1168 participants suggested that incorporating senior commander, leader and chaplaincy input into WRT may have helped to promote engagement with the process and to reduce barriers to care (Jarrett, 2008).

Military commanders can be resistant to intervention by mental health practitioners. 30 mental health professionals from 23 countries shared the view that military leaders were frequently ambivalent about the use of mental health support especially within the operational area (Adler et al., 1999). Within the UK AF, stress management training (SMT) is often delivered by mental health practitioners and, despite the apparent resistance to mental health practitioner input, is a form of psycho-education that is popular among leaders as it can reach large numbers personnel

simultaneously, is largely passive and requires minimal time commitment on the part of the person delivering the education session. When scripted, it has the advantage of delivering a pre-rehearsed and standardised message, which is helpful for any subsequent evaluation. The education session (often termed a 'briefing' in a military context) often takes place in isolation with little or no follow up practice and frequently lacks a skills acquisition element. Stress inoculation training, a structured form of SMT, cannot be said to have been delivered unless skills practice and confirmation takes place (Meichenbaum, 2007).

Briefing activity is not just confined to deployment preparation in the UK AF, being repeated at various times throughout the deployment cycle (Joint Service Publication 770). Despite wide implementation, few robust studies report a reduction in workplace distress through the provision of education-based SMT (Taylor et al., 2011; Rose et al., 2012). In a systematic review of the military psycho-education literature (Mulligan et al 2010), two surveys and seven intervention studies were identified, three of which were randomised controlled trials (RCTs). Overall there was some inconsistent benefit for psycho-education when it was embedded in complex post-exposure psychological interventions. Positive outcomes in this context were related to reduced levels of alcohol misuse (Deahl et al., 2002; Adler et al., 2008) and there was some evidence that occupational functioning could be improved (Greenberg et al., 2010). Some researchers have however questioned whether one-dimensional measures of psychological symptoms are a useful index of effectiveness and suggest that multiple measures of functioning, perhaps including organisation level outcomes might be more appropriate (Deahl et al., 2001). A US study that assessed psychological debriefing with an overt interactive psycho-educational component reported a positive effect upon posttraumatic stress disorder (PTSD) symptoms (Adler et al., 2009) though this was only apparent in a specific sub-group of heavily combat-exposed

personnel. Debriefing is a popular vehicle for delivering psycho-education despite little evidence for its effectiveness. When examined closely, studies purporting to show a positive benefit for debriefing-based approaches often base their conclusions upon subjective opinion and anecdote. For instance, a deployed crisis-intervention team used a critical-incident stress-management model to provide supportive services, including psycho-education, to 100 members of a US rescue squadron responding to a terrorist bombing. Although no effect upon mental health was demonstrated, the critical-incident stress management model was considered as an important component of post-incident support (Budd, 1997).

Other non-debriefing based interventions with a clear psycho-educational component, such as mental health first aid (MHFA), report only satisfaction and efficacy ratings in those trained to deliver the intervention rather than psychological or behavioural outcomes in recipients (Jorm and Kitchener, 2011). The lack of robust evidence regarding the general effectiveness of psycho-education notwithstanding, some studies have found specific benefits in providing pre-deployment psycho-education for military personnel who subsequently experienced higher levels of exposure to potentially traumatic events during their period of deployment (Iversen et al 2010; Mulligan et al., 2010).

In summary, brief preventative interventions with a simple psycho-educational component are not always rigorously evaluated and tend to show limited effectiveness or differential sub-group effects (Taylor and Schatz, 2011). Briefing or psycho-education alone seems insufficient to have a substantial effect upon mental health and more prolonged, immersion or follow-up training may be needed to ensure that self-management skills are assimilated (Ferdos and Sayed-Hossein, 2007). Recognising the shortcomings of brief psycho-education, researchers have suggested that

primary prevention might helpfully include interventions that require active participation such as formal anxiety management training that includes a discrete behavioural skills practice component (Bouchard et al., 2011).

Given the apparent shortcomings of single episode brief interventions, it is probably wise for UK AF commanders to emphasise the role of effective leadership in supporting military mental health. Substantial evidence suggests that mental health is associated with good leadership (Jones et al., 2012; Du Preez et al., 2012; Whitesell et al., 2012; Dickstein et al., 2010; Noy et al., 1984) whereas negative views of leadership have been found to be linked to the development of PTSD (Castro et al., 2009). Leadership is thought to be essential to operational effectiveness where it functions as a primary prevention activity but has a part to play in all levels of prevention. In a review of coalition partner's mental health provision during deployment to Afghanistan, common areas of practice included attempts to foster mental resilience, self-regulation and psychological empowerment at various stages of the deployment cycle. Effective leadership and peer support were cited as being crucial to the delivery of such interventions, to military mental health generally and to reducing perceived barriers to care (Vermetten et al., 2014).

Primary Prevention During Deployment

Turning to primary prevention activity undertaken during deployment, in an effort to support deployment mental health, for many years, international Armed Forces have attempted to mitigate the cumulative fatigue arising from military operations overseas by providing a period of prolonged rest at some point during deployment. Currently, UK AF personnel deploying for

six months or more receive a single continuous 10 day period of rest and recuperation (R&R) at some point during their deployment. This includes travel to and from the place of departure which is often a military airport established as a logistics hub, but can be a maritime port within or close to the operational area. The stated aim of R&R is to 'provide those who have been mentally and physically challenged by continuous service, usually in an operational area, time to rest out of the line and 'recharge their batteries' in order to sustain operational effectiveness' (Joint Service Publication 770). In this sense, R&R may function as a primary preventative mental health measure as it is mostly concerned with averting mental breakdown. During recent campaigns, UK AF have provided R&R at home, although R&R can take place within a purpose designed safe location close to the operational area. Previous studies suggested that R&R is popular (Jones et al., 2011) and it is provided by most coalition nations (US DoD, 2004). Despite widespread and routine implementation of the strategy, there is no current empirical evidence of a primary preventative mental health benefit for R&R among UK personnel. The only published research investigating the mental health benefits of R&R evaluated US personnel undertaking peacekeeping duties in Bosnia Herzegovina in the 1990's. In that study, no long-term mental health promotion benefits were found among personnel taking R&R (Bell et al., 1997).

In civilian settings, taking rest and holidays are much cherished and are thought to boost morale and reward employees, particularly those in high stress occupations. There is however, only a small amount of research suggesting that there is an enduring positive psychological effect for vacationing. In a pre-post vacation study conducted among industrial workers, immediately after vacation, physical complaints, sleep and mood had improved compared to baseline. Physical wellbeing improvements persisted five weeks after returning from holiday (Strauss-Blasche et

al., 2000). In a study of the experience of holidaying and its impact upon work, mood gradually improved mid-holiday with the maximal psychological effect occurring just before returning home; travel was reportedly the most stressful part of the holiday (Nawijn, 2010). High levels of working overtime have been linked to adverse health outcomes (Taris et al., 2011). Although holidaying appeared to help with physical recovery and general wellbeing when people were working hard (Gilbert and Abdullah, 2004), the effects were often short-lived (de Bloom et al., 2010). The process of recuperation from occupational stress appears complex and may require a comprehensive solution that goes beyond the simple provision of rest (Zijllstra and Sonnentag., 2006). A review of UK offshore oil worker's schedules noted that whilst the typical offshore work rota allowed for over 26 weeks onshore, taking less frequent but longer breaks was associated with difficulty re-adjusting to oil platform work routines upon return, whereas having more numerous shorter breaks was not (Parkes, 2010). Clearly, the pattern of rest taking may be an important consideration when planning rest and recuperation strategies.

Third Location Decompression

At the end of a period of operational deployment, a brief pause occurs some 24-36 hours after leaving the operational area; this is known as third location decompression (TLD). TLD is thought to function as a primary preventative intervention in that it is intended to promote better post-deployment readjustment to homecoming and by implication, better mental health. TLD aims to allow military personnel to begin to psychologically 'unwind' after operational deployment through the provision of a brief period of structured rest (Hacker-Hughes et al., 2008) and is a discrete component of the comprehensive post operational stress management

(POSM) process (Joint Service Publication 770, Hacker-Hughes et al., 2008). TLD formally marks the transition from being deployed on operations to peacetime duties. During recent UK AF deployments to Afghanistan and Iraq, TLD took place in Cyprus; this constitutes the 'third location' in that it is geographically removed from the area of deployment but is not the home location. TLD has been mandatory since 2007 for the majority of personnel who are members of formed units that deploy (Fertout et al., 2011[b]). When initially established as a routine component of the POSM process, TLD aimed to ensure that formed unit (FU) personnel who had deployed together were able to unwind together, the rationale being that it would enable individuals to make use of support from their peers in a neutral and stress-free setting. However, the popularity of TLD among commanders as a brief and ready-made stress-reduction intervention resulted in a change in policy. From early in 2011, following an evaluation of the experience of TLD for those deploying as individuals without the support of their peers (Fertout et al., 2011), it has been Ministry of Defence policy that all personnel who deploy for periods in excess of 30 days will undertake TLD. The standard TLD package lasts for approximately 24-36 hours during which time attendees undertake a structured programme of activities including social events; these are mostly centred on and around a local beach and a communal area developed within a secure location to encourage participation in a range of relaxing social and leisure activities. In addition, two short, distinct and mandatory psycho-educational briefings are delivered prior to an evening barbeque followed by an optional social event. The briefings take two forms; the first is a 'coming home' brief usually delivered by a padre or faith leader who discusses common readjustment problems and potential ways to overcome them. The second briefing is characterised by formal psycho-education which seeks to help personnel to identify mental health disorder symptoms both in themselves and in others. This briefing effectively

'signposts' those whose initial symptoms fail to remit to appropriate sources of help. The two briefings aim to assist post-deployment re-adjustment, including reintegration with family and friends and to facilitate the homecoming transition.

The UK AF recognises that it has a problem with excessive alcohol use (Fear et al., 2007) and as operational deployment is 'dry', early attempts are made to provide an opportunity for the limited consumption of alcohol so that its effects can be experienced in a controlled environment following a prolonged period of abstinence (Burdett et al., 2011). During the early development of TLD, the provision of unlimited alcohol had unintended adverse consequences (The Scotsman, 2014); a token system was subsequently introduced to restrict personal intake and consumption was carefully monitored by designated unit leaders and TLD staffs. Controlling alcohol use appears to be universally important and post-deployment alcohol misuse similarly affects other NATO forces. Combat deployment may be a precipitant of alcohol misuse; among 568 US soldiers taking part in a post-deployment survey, 35% of participants were drinking in a problematic manner. In this study, risk factors for post-deployment alcohol misuse included greater levels of exposure to potentially traumatic and combat events (Cheng et al., 2012). Among a sample of 7849 US soldiers, a third screened positive for alcohol misuse and just under half of those screening positive also reported risky behaviour related to alcohol misuse (Clarke-Walper et al., 2014). Given the potential for alcohol to adversely impact post-deployment readjustment, the intention of UK AF commanders is to intervene early during TLD to demonstrate alcohol's powerful effect so that returning personnel understand the requirement to limit its use.

Other nations such as the Netherlands, France and Canada all make use of decompression in a variety of forms, but only Canada has published a review of their decompression arrangements (Zamorski et al., 2012, Garber and Zamorski. 2012). Canada currently delivers a three to five day package in Cyprus where personnel are accommodated in hotels and are given spending money; French arrangements are for three days in Cyprus; the Dutch provide three days in Crete; Australia provides rest within the operational area with a psychologist interview when deployment is over and the US provide a period of 'normalisation' in the home garrison prior to taking post-deployment leave.

Most decompression-based post-deployment interventions are delivered during a brief window as personnel transition home. In research examining different models of post-deployment support, returning from deployment by sea appeared to provide a longer period within which to deliver comprehensive psycho-education and 'decompression' of combat stress compared to those who returned by air. Therefore, the timing and duration of this form of preventative activity may need to be taken into account when refining current decompression models (Johnston et al., 2009).

The content of TLD briefings require comment; combat invariably involves the death of colleagues and friends although grief and loss during deployment appears to be an under-researched area of primary prevention. The recent death of someone close can be an independent risk factor for poorer mental health among military personnel (Fink et al., 2013). Despite this, otherwise comprehensive primary prevention strategies such as TLD, SMT and psycho-education rarely contain a distinct griefwork component or indeed any advice about dealing with

loss. To date, no evidence about the effect of TLD upon mental health and post-deployment readjustment has been published.

Battlemind

Most coalition forces seek to promote post-deployment readjustment using interventions which are intended to ease the return to garrison life (Fertout et al., 2011). In its various forms, the US Army Battlemind training system contains an overt psycho-educational component which requires those in receipt of the intervention to actively engage with the instructor and is therefore an interactive process. This is particularly true of the post-deployment element of the Battlemind system. Modules have been developed to include the unique requirements of the military spouse (Sayers, 2011), the needs of children within military families, psychological debriefing and Battlemind further extends to top-up components that aim to promote resilience across the deployment cycle (Bowles and Bates, 2010). The US system has been subject to assessment among US military personnel and the outcomes suggest that it has a specific limited but positive effect upon PTSD symptoms in those reporting the highest levels of combat (Adler et al., 2011). A UK research team developed an anglicised version of post-deployment Battlemind and conducted a cluster RCT in over 2400 UK AF personnel returning from operations (Mulligan et al., 2012). Receipt of Battlemind was associated with less binge drinking but had no statistically significant effect upon other mental health measures compared to receiving a standard mental health briefing.

Recently, US researchers have concluded that there is a lack of clear evidence for many of the military primary and secondary prevention activities conducted in both the deployed and non-

deployed settings (Slomski et al., 2014). Despite comparatively low levels of efficacy for the various primary preventative mental health interventions, across four nation's militaries, more than 70% of surveyed personnel indicated high degrees of satisfaction with the content of and time allocated to mental health support training. The study authors noted that, despite cultural and organizational differences, mental health training programmes can be adapted for use across various nation's Armed Forces (Foran et al., 2013). In the context of weak evidence of general effectiveness, the latter study findings confirm the view that perceived utility and subjective satisfaction are no guarantee that a positive mental health effect will come about as a result of primary preventive activity.

Secondary Prevention

Secondary prevention is primarily concerned with detection and risk reduction in those who have yet to experience formal disorder, but are at risk of developing a formal or diagnosable mental disorder. During deployment, the US military makes use of operational stress control (OSC) which, rather than being a single intervention, is more a package of measures. Successful delivery relies on the responsiveness and composition of the stress control team as they attempt to reduce mental health-related stigma and other barriers to care in an effort to bring about rapid and sensitive early intervention (Pincus et al., 1998). In a study of a US OSC-based secondary prevention programme delivered to military personnel serving in the Western Pacific, the multidisciplinary 'Outpatient Crisis Prevention Program' sought to teach coping skills to distressed personnel. The programme appeared to be effective in reducing depression and anxiety symptoms among participants although the ability to attribute positive outcomes to the any single aspect of the programme was limited by the study design. Nevertheless. follow-up

data indicated that gains were maintained one month after treatment (Jones et al., 2008). Early detection in a military context is vital as research suggests that mental health treatment outcomes can be less favourable overall for military personnel than for their civilian counterparts and the avoidance of chronicity is therefore important (Creamer and Forbes. 2004).

Screening

In a military context, an example of detection activity is formal psychological screening, which has been used as a tool to deliver both secondary and tertiary prevention. Post-deployment psychological screening attempts to identify military personnel who may be at risk of developing psychological symptoms on return from operations or following exposure to potentially traumatic events. In addition to having some level of proven utility, any secondary prevention activity such as screening is best delivered within a supportive occupational environment in order to maximise acceptability (Rona et al., 2004). Furthermore, field workers suggest that both screening and other detection-based interventions will invariably benefit from oversight by a coordinating body to maximise effectiveness and reduce duplication of effort (Dodgen et al., 2002).

Although secondary prevention is primarily the concern of line managers, in an occupational context it requires increasing levels of support from healthcare as inevitably recipients may require some level of therapeutic intervention, especially post-screening. Routine mental health screening is undertaken by a number of nation's military forces, most notably the US. This has been carried out both pre- and post-deployment (Hoge et al., 2006). Empirically, there is little evidence for the efficacy of mental health screening (Rona et al., 2005) and there is some

suggestion that reliable symptom reporting may be affected by many factors, perhaps most importantly anonymity considerations as screening requires the use of personally identifiable information so that cases can be offered further help (Ong and Wiss, 2000; Fear et al., 2012; Warner et al., 2011; McLay et al., 2008). Pre-deployment screening may be particularly ineffective for low prevalence disorders (Rona et al., 2006) which, in a UK military context, includes symptoms of PTSD. Low prevalence of mental disorder is found among a number of coalition partner forces with perhaps the exception of the US. In screening conducted among Canadian Forces personnel, symptoms of mental disorder were detected in 10.2% of those screened (Zamorski et al, 2014). It is broadly accepted that successful screening programmes must engage the right people with the right services at the right time. There is some evidence from military studies that this may not necessarily occur and that engagement with helping agencies may be particularly problematic among alcohol misusers. In a substantial review of screening outcomes, 29% of regular US Army personnel were classified as problem drinkers and 6% had AUDIT-C scores ≥8. In follow up interviews, 62% of those who initially screened positive and 75% of those with initial AUDIT-C scores ≥8 were assessed as having alcohol problems. Only 29% of problem drinkers and 36% of those with AUDIT-C scores ≥8 were referred for further help. The authors conclude that opportunities to offer a comprehensive secondary prevention intervention may have been missed despite providing screening services (Larson et al., 2014).

Among 3,852 Canadian Forces personnel who took part in a screening programme, both mental disorder symptoms and personality factors were significantly associated with alcohol use. The risk factors for alcohol misuse identified in this study and which might form part of a screening

programme could pose a dilemma for commanders. A number of the characteristics representing risk factors for alcohol misuse were potentially desirable military characteristics. Commanders would probably not wish to see potential recruits with such characteristics debarred from entry into military service and for serving personnel, restrictions placed upon continued service and further promotion. These limitations notwithstanding, the authors argue for the use of preventative interventions for mental distress during early military service that might help to promote resilience and protect against later alcohol problems thus minimising the requirement for screening (Skomorovsky et al., 2012). Given the uncertainty about the effectiveness of screening, and that it is mandatory among returning US service personnel thus rendering comparative studies all but impossible, the US Department of Defense has now funded a randomised controlled trial of psychological screening and stepped care among UK AF personnel (www.kcl.ac.uk/kcmhr/research/kcmhr/post.aspx).

Informal and Alternative Forms of Screening

Although it does not constitute screening in the formal manner described above and takes place later in the deployment cycle, one form of detection used within the UK AF is the low level post-deployment psychological interview conducted by a line manager some three months after returning home (LFSO. 2006). Here, individuals are asked about their deployment experiences and whether they have any unremitted symptoms of mental ill-health. More proximal to experiencing a potentially traumatising event, peer-led support programmes use military colleagues who are trained to detect early problems and signpost those affected to potential sources of help (Keller et al., 2005). In a military context, peer support is often focused upon those exposed to combat (Frappell-Cooke et al., 2010) or severe training accidents. Although

peers carry out a formal risk assessment, the process is not screening in its traditional sense as it forms just one element of post-exposure support and is more akin to a mentoring process. A number of peer support programmes exist, some using peers as 'counsellors' (Levenson et al., 2003). The UK AF Trauma Risk Management (TRiM) programme is a form of peer support that is well accepted and may well have some organisational occupational benefits (Greenberg et al., 2011[a]). Although most peer-led programmes do not constitute counselling as such, encouraging self-disclosure by affected personnel is at the heart of many such interventions. Disclosure has been suggested as a method of ameliorating psychological distress following exposure to potentially traumatic events. In a study of 426 U.S. military personnel who served as peacekeepers in Somalia, adjustment to the peacekeeping mission was said to be significantly related to self-disclosure; such disclosure was helpful when made to both peers and supportive significant others (Bolton et al., 2003). Some commentators have cautioned that forced retelling of unpleasant experiences might well be the prime reason why critical incident stress debriefing apparently fails (Watson and Shalev, 2005) and there is clearly a fine balance to be struck when using interventions with a disclosure component including peer support strategies.

Mental Health Stigmatisation and Perceived Barriers to Care (Stigma/BTC)

Successful secondary prevention relies on being able to detect the early signs of psychological distress and emerging mental health disorder so that symptomatic individuals can be engaged with appropriate help. Among the proposed causes for failure to engage with potential sources of help (Vogt, 2011) and to participate fully in mental health screening programmes (Keeling et al., 2012) are the effects of stigmatising beliefs (Stigma) and perceptions that barriers to care

(BTC) are present (Paykel et al., 1998). Although mental health stigmatisation is complex and defies a simple definition, researchers suggest that it is a social/cognitive construct that, in the context of help-seeking, incorporates behavioural attempts to avoid the label of mental illness and the perceived harm that it brings. Mental illness is inferred by cues that elicit a stigmatising response such as psychiatric symptoms, social-skills deficits, physical appearance and labelling whereby the person is thought to be consulting a psychiatrist, taking psychoactive medication and so forth. The presence of mental illness is widely viewed in a negative manner and subjectively diminishes a person by way of potential negative occupational, social and financial effects (Corrigan, 2000). Fear of the perceived consequences of mental illness promotes the avoidance of help, support and treatment and non-adherence to therapy (Kessler et al., 2001). The available research suggests that stigma is commonplace among military personnel (Britt et al., 2007; Osorio et al., 2012; Osorio et al., 2013; Iversen et al., 2011) and that it may be particularly high during deployment. In a survey of US marines, stigmatising thoughts about having developed combat stress reaction appeared to act as a barrier to seeking help or support from deployed combat stress control practitioners (Momen et al., 2012). Furthermore, stigma appears ubiquitous and comparable in character within various national Armed Forces (Gould et al., 2010), although this may be partly related to the use of similar stigma measures across various military studies. Although the greater proportion of the research literature deals with mental health stigmatisation, it appears that stigmatisation is not uniquely related to mental illness symptoms; it is said to be a substantial impediment to help seeking for physical illness (Crandall and Moriarty, 1995) and may also affect civilians in equal measure (Woodhead et al., 2011).

The Effect of Stigma/BTC on Help-seeking

Some researchers have suggested that the presence of stigma/BTC may limit the willingness of military personnel to disclose symptoms (Seal et al., 2008); however, others suggest that stigma/BTC may be weakly or wholly unrelated to decisions about seeking help (Cooper et al., 2003). Alternative explanations for failure to engage with help include simply failing to recognise psychological symptoms. Research conducted among Canadian military personnel suggested that non-help-seeking may have resulted from just such a cause. In this case, stigma was not the prime driver of non-help-seeking. Early recognition of symptoms may be crucial to operational effectiveness as the Canadian research further suggested that sub-threshold mental health symptoms were often associated with varying degrees of occupational impairment that may have benefited from intervention in order to restore effective functioning at work (Zamorski et al., 2011). Of course, the problem of engagement with help does not end with stigma reduction, when military personnel do enter treatment, premature treatment cessation is problematic (Seal et al., 2010) although this seems to be more of a problem among older people (Sirey et al., 2001).

Despite the alternatives listed above, the consensus view appears to be that there is a moderate to strong association between stigma/BTC and help-seeking. Negative attitudes about the outcomes of mental health treatment and the causes of mental illness may be particularly important determinants of failure to engage in therapy among military personnel (Kim et al., 2011; Pietrzak et al., 2009). Researchers have theorised that reduced help-seeking occurs when military personnel predict that seeking support will lead to being ostracised with an accompanying loss of social position, or that occupational restrictions might ensue (Langston et al., 2007). The net

result may, therefore, be a potentially highly detrimental effect upon one's military career and a loss of military standing. Help-seeking inhibition appears to be particularly marked within certain occupational groups such as the military whose culture may unintentionally foster mental health stigmatisation (Britt and McFadden. 2012). Fear of receiving treatment appears to be widespread (Kushner and Sher. 1989) and when coupled with a desire to overcome mental health problems without external support further acts to inhibit treatment seeking. The latter is thought to be particularly strong in younger people (Gulliver et al., 2010) who constitute the bulk of military personnel. Stigma/BTC may not always have a straightforward inhibiting effect; recent research suggests that military personnel frequently report negative views about mental health counselling but in some circumstances appear able to effectively override such beliefs in order to access care (Elnitsky et al., 2013).

Components and Characteristics of Stigma/BTC

Although not always easy to categorise, stigma/BTC can include self-imposed concepts such as viewing mental health symptoms as being somehow 'self-induced' and may incorporate rules such as not being allowed to admit to having a problem, which appears to be associated with a strong sense of pride, or needing to deal with difficulties oneself (Stecker et al., 2007) rather than utilising healthcare providers. Indeed, self-management has been reported as the preferred mental health pathway for military personnel (Kim et al., 2011) and that the desire to self-manage may be a component of the help-seeking decision making process that may rank alongside stigma/BTC as a help-seeking inhibitor. Most mental health-related stigmatisation appears to fall into three broad categories (Rusch et al., 2014); self-stigma, related to self-perception, which is the prejudice that people with mental illness internalise (Corrigan and Watson, 2002); public stigma, referring to the outside world (Pepin et al., 2009), which is

characterised by concerns about the reaction that the general population might have towards a person with mental illness and structural discrimination, which comprises rules and regulations in society that intentionally or unintentionally disadvantage people with mental illness. Among the published studies, some report little or no association between help-seeking and public stigma (Golberstein et al., 2009), whereas others suggest that self-stigma may be a substantial determinant of help-seeking (Vogel et al., 2006); indeed, self-stigma has been reported in some studies to be the greatest contributing factor to both engaging in and continuing with mental health treatment (Schomerus et al., 2009). To the three categories of stigma, a fourth element can be added which is related to practical barriers to care which have been cited as discrete impediments to help-seeking. The possibility that mental health treatment might impact upon future employability and income is thought to be an important component of perceived BTC (Clement et al., 2012) and there is some suggestion that BTC may be related to socio-economic status, since income might influence such factors as practical transport arrangements, childcare and other aspects of affordability rather than stigmatisation per se (Alvidrez and Azocar, 1999).

Military Stigma/BTC Interventions

The military of many nations, including the UK, have sought to reduce stigma/BTC, mostly through group-based, public health activities such as psycho-education (Zinzow et al., 2012). Educational interventions often incorporate mixed media campaigns and peer support programmes (Ben-Zeev et al., 2012). The effectiveness of adopting such approaches is at best mixed with some outcome studies reporting substantial and durable positive effects upon stigma-related knowledge (Dalky, 2012), while others suggest that background levels of stigmatising beliefs remain largely unaffected (Abraham et al., 2010; Luty et al., 2007). As a counter-point to

the overwhelming opinion that stigma should be reduced wherever possible, Osorio et al (2012) argue that stigma can sometimes help to foster military fortitude during deployment and there is some evidence that at times of increased exposure to potentially traumatic events, many people who choose not to seek help may well recover without formal treatment or therapy (Richards, 1999). Deployment may not therefore be the best circumstance in which to attempt stigma reduction. Some personnel may not recover from reduced mental health; US forces in particular appear to be experiencing a substantial trend where for many, symptoms of PTSD become more frequent as time since deployment increases (Sundin et al., 2010), stigma/BTC reduction may be more crucial in such circumstances.

The Use of Peer Support to Reduce Stigma

One possible solution to overcoming stigma and engaging military personnel with support services is to use TRiM practitioners within a secondary preventative context to mitigate risk factors (Jones et al., 2003). There is as yet no definitive or even strong evidence for a positive effect for peer support programmes upon either mental health or stigmatising beliefs. Novel stigma-reduction strategies have been tried; the 'One Shot – One Kill' (OSOK) intervention, a military culture sensitive programme, sought to reduce stigma and improve help-seeking among 320 personnel during their deployment to Iraq in 2008. The outcome of the programme suggested that it improved rates of help-seeking among attendees although it was unclear whether stigma-reduction was directly responsible for this effect (Lunasco et al. 2010). Other interventions for military personnel include integrating the stigma-reduction strategy into a comedy show, which had appeared to have a positive but probably transitory effect (Jones et al.,

2014).

The Difficulties of Reducing Stigma/BTC

Stigma seems to be a substantial and resistant problem (Brown et al., 2011); however, it seems that it can be influenced by the attitudes and behaviour of middle tier military commanders who may have a central role to play in stigma reduction (Britt et al., 2012). The available evidence appears to suggest that there is a complex interdependent relationship between stigma/BTC, the recognition of symptoms, the occupational and social impact of psychological symptoms and the prevailing level of mental health. Furthermore, providing an effective occupational secondary prevention strategy focused on mental health is challenging as the available research suggests that people may often not recognise that they have a problem (Kessler, 2000). Although an empirically derived link between stigma/BTC and prevailing mental health has been demonstrated, longitudinal studies are uncommon and it is difficult to know whether changes in mental state are associated with corresponding fluctuations in stigma/BTC over time (Zinzow et al., 2012). Some military research suggests that self-stigmatisation is determined by current levels of subjective stress, substantial work overload and mental health symptoms (Britt et al., 2008). PTSD symptoms in particular have been cited as being strongly related to greater levels of perceived stigmatisation and reduced help-seeking (Ouimette et al., 2011). The available research therefore suggests that the relationship between current mental health status, prevailing levels of Stigma/BTC and help-seeking is complex. Furthermore, it appears that stigmatisation may differ in character to perceived barriers to care and each factor may well exert both overlapping and unique influences upon help-seeking and mental health.

Tertiary Prevention

Mental Health, Work and Sickness Absence

As described earlier, reduced occupational fitness is commonplace among the UK working population with musculoskeletal conditions and common mental disorders cited as the main reasons for sickness absence from work (Henderson et al, 2005; Stansfield et al., 2011). Military personnel, while carrying out a unique role are merely a product of the social milieu from which they are recruited. In order to understand military tertiary prevention activities, it is important to examine the argument that many tertiary measures developed for the UK general population may apply to military personnel. In a civilian context, poorer mental health status appears to increase the likelihood of sickness absence; UK studies suggest that employees with mental health conditions are twice as likely to be absent from work than those with physical health conditions (Black, 2008). Although having a diagnosed health condition increases the likelihood of sickness absence, studies suggest that perceiving that one is ill is an additional vulnerability factor for sickness absence independent of a firm diagnosis (Henderson et al., 2013). In a longitudinal study, baseline levels of mild to severe psychological distress predicted the award of a disability pension later in life (Rai at al., 2012) and more frequent sickness absence appeared to be predictive of future sub-optimal health including mental ill-health (Ferrie et al., 2011), more physical complaints and reduced ability to work (Gustafsson and Marklund, 2011). The economic cost to employers of reduced occupational fitness and sickness absence is substantial (Goetzel et al., 2004) as is the financial burden upon individuals. Absence from work on mental health grounds appears to be associated with long-term income poverty when compared to absenteeism related to acute or non-chronic general health conditions. Furthermore, income

poverty continues to have a greater effect upon those who retire on mental health grounds compared to those retiring for other health reasons (Schofield et al., 2013a). Those who retire early for reasons other than ill-health, as well as those in full-time and part–time employment, are all significantly less likely to experience income poverty than those who retire early due to all-cause ill-health (Schofield et al., 2013b). Recognising the substantial health and economic impact of long-term sickness absence, the National Institute for Health and Clinical Excellence published guidelines for managing work absence and incapacity (NICE, 2009). The available data, therefore, suggests that among civilian populations, ill-health adversely impacts occupational functioning and creates a propensity to poverty; poor mental health may be particularly problematic in this regard.

Although much of the available research relates to the civilian context, sickness absence affects UK AF personnel in a similar way to their civilian counterparts. In order to maintain an optimally prepared fighting force, the UK AF manages those affected by mental health disorders within a unique occupational health framework described earlier in this chapter. All military personnel are assigned a medical grading commensurate with any limitations arising from the state of their health (Braithwaite et al., 2009). For mental health conditions, the grading reflects factors such as attentional impairment when carrying out safety critical tasks, the resupply of psychoactive medication during deployment and so forth. Through the use of medical categorisation, the UK AF aim to retain personnel in appropriate work wherever possible, albeit in a sometimes modified way. Medical restrictions can be imposed temporarily or can be made permanent in the case of chronic disorders which limit the ability to deploy, although this does not debar the person from carrying out some useful military role. Occasionally a health condition is such that the affected person cannot perform any appropriate military role and, after

a careful review by a panel including occupational health professionals, they may be medically discharged from the UK AF. In addition to work-role management, recommending short periods of sickness absence can be an option in the same way as in a civilian work context. Such occupational health arrangements should theoretically provide the correct environment in which to deliver tertiary prevention through the initiation and monitoring of therapeutic interventions.

Tertiary Prevention in a Military Context

As noted above, there is a dearth of information about the effects of mental ill-health on military occupational functioning. Although UK AF based research has been conducted, it is largely focused upon the association between PTSD and self-reported occupational impairment (Rona et al., 2009). Direct objective measures of longitudinal occupational adjustment have been assessed in relation to UK Service personnel hospitalised with mental health problems (Jones et al., 2009), deployed UK mental health casualties (Jones et al 2010) and among reserve forces mental health casualties (Jones et al., 2011). The only UK study examining mental health treatment for regular forces in a non-deployed setting measured short-term outcomes and did not provide longitudinal data (Gould et al., 2008).

As a component of tertiary prevention, there is some evidence in various outcome studies that maintaining people affected by mental health symptoms in their place of work can be beneficial to psychological health, particularly among men (Cable et al., 2008). The ability to retain people with mental health problems at work is often related to the supportive behaviour of supervisors (Neilsen et al., 2006) and also the occupational health and welfare support that the organisation chooses to put in place (Couse, 2008). Some researchers caution that coming to work when sick

can negatively impact long-term mental health (Bergström et al., 2009). This is sometimes referred to as 'presenteeism'. It seems that there is a careful balance to be struck between maintenance at work, which may benefit both the organisation and the individual and potential adverse consequences, which may compound negative productivity effects. In a military context this is particularly important as military roles can involve exposure to combat and other stressful or even unpleasant tasks that can have profound psychological consequences. For example, Israeli soldiers treated early for combat stress disorder (CSD) during the 1982 Lebanon war experienced poorer long-term mental health than a group who emerged from combat operations without mental health problems. Furthermore, poorer mental health persisted in the CSD group for some time post-conflict (Benbenishty, 1991). Tertiary prevention is mainly used when mental disorder has developed to alleviate symptoms and improve quality of life. Even at this stage of prevention, transforming risk factors for further deterioration can be a target for intervention. Whilst it is beneficial for line managers to actively support rehabilitation, tertiary prevention is mainly the responsibility of healthcare professionals (Cooper and Cartwright, 1997). Recent research suggests that adopting a tertiary preventative approach of this kind within a workplace context may help to prevent the further development of depressive symptoms (Ahola et al., 2012), though it appears less effective for general mental health complaints where it seems to be successful only when it is driven by a desire to return to work rather than with the objective of decreasing symptoms (van Oostrom, 2010).

Deployment Mental Healthcare

For military commanders, mental health is a necessary consideration if they are to promote occupational wellbeing during deployment where appropriately trained replacement personnel

may be at a premium. Contemporary studies have explored the effectiveness of occupationally-focused mental healthcare among UK Service personnel located in their home base before or after undertaking combat deployment (Gould et al., 2008; Iversen et al., 2009; Turner et al., 2005; Jones et al., 2011) and some studies evaluate mental healthcare when military personnel are deployed on combat operations (Garber et al., 2012; Schmitz et al., 2012; Scott, 2005; McAllister et al., 2004). Although there is some suggestion that such care has a positive short-term effect, the available research tends to focus exclusively on short-term outcomes, for instance, if a person returns to or remains at work during or after care. The majority of deployment mental health research is conducted following deployment using retrospective self-report data (Fear et al., 2010; Seal et al., 2009) or takes place after discharge from service (Seal et al., 2010; Zeiss and Karlin, 2008) and so lacks detail about what actually happened in the operational theatre.

Although a broad range of treatment options are available, some aspects of military service appear to impact upon the choice of treatment modality. Among clinicians delivering care to military personnel there is some evidence of a reluctance to prescribe medication as receipt of medication can affect access to weapons and engagement in safety critical tasks. A review of tertiary prevention among Canadian military personnel suggested that 32.1% of those with a diagnosis of major depressive illness received antidepressant medication which the authors believe is probably an under-use of an available effective tertiary measure (Sanyal et al., 2011). During deployment in particular, minimising functional impairment is crucial to maintaining operational effectiveness and facilitating full engagement with the military occupational role. In the deployed setting, prescribing psychoactive medication is problematic as it may impact on the

person's ability to carry out their military role or even to remain in the operational area. Other interpersonal therapy approaches are therefore required and the use of forward psychiatry principles may be a useful way of approaching mental health management. There appear to be some disadvantages when adopting such an approach. In a follow-up study of Israeli troops who suffered psychiatric disorder during a period of intense hostilities, some 18 months after the war's end, the majority of mental health casualties were currently functioning well below pre-war levels in their military role (Levav et al., 1979). Other studies of mental health disorders occurring during military deployment confirm the finding that they contribute substantially to impaired general function (Eisen et al., 2012) and impaired functionality resulting from mental disorder has been linked to enduring adverse occupational effects in civilian studies (Henderson et al., 2011).

Studying the effects of deployment mental healthcare is crucial as the timing and type of care can have long-lasting effects. Analysing data from battlefield mental health treatment records gathered during the 1982 Lebanon war and making comparisons with historical data, Israeli research suggests that rates of mental health disorder were similar to those observed in other wars. Emphasising the importance of early forward treatment, combat stress reaction (CSR) comprised 15 to 20% of the total casualties during the active phase of the war and treatment on the battlefield was more effective in returning soldiers to their units than treatment following airlift to a rear area (Noy et al., 1984). In extended follow-up, Israeli Defense Force (IDF) personnel who developed CSR during deployment were vulnerable to poorer long-term mental health compared to those who did not experience psychological breakdown (Solomon et al., 2005); however, IDF personnel who received mental healthcare for a CSR during deployment fared better in extended follow-up than individuals with CSR who did not obtain treatment.

Longitudinal studies of UK deployment mental healthcare are scarce, particularly those that assess the occupational consequences of such care.

In the UK AF, to deliver tertiary prevention during operations, mental health professionals deploy as Field Mental Health Teams (FMHTs). FMHTs practice occupationally focused 'forward psychiatry' (Jones and Wessely. 2003) using the guiding principles of PIES (Jones et al., 2007) where ***P****roximity* denotes treatment that should occur close to the battle area, ***I****mmediacy* refers to early active treatment, ***E****xpectancy* to engendering anticipation of recovery and return to duty (RTD) and ***S****implicity* refers to the use of brief interventions aimed at restoring physical and psychological wellbeing. In effect, PIES functions as a tertiary prevention tool during deployment. Among the majority of UK AF personnel, mental disorders are non-psychotic in nature and a range of evidence-based therapies and treatments are available that should help personnel afflicted by symptoms of common mental disorder to return to operational fitness. Recent military research has tended to focus upon the management of PTSD yet both UK AF and international military research suggests that therapy for non-PTSD disorders should be a major focus of the treatment effort both in the deployed and non-deployed settings. In a study of treatment seeking German soldiers deployed to Afghanistan and the Balkans, the most commonly diagnosed disorders were acute stress disorder and affective disorders rather than PTSD (Kowalski et al., 2012). For deployed UK AF personnel, there is some positive evidence for tertiary prevention when therapy maintains symptomatic personnel in the workplace whilst offering support (Jones et al., 2010). Research outcomes among other national military forces question whether a simple measure of maintenance within the current military role is an adequate index of the effectiveness of military mental health care (Levav et al., 1997). Researchers have

suggested that there may be unforeseen negative consequences of deploying 'forward psychiatry' to promote presenteeism (Solomon and Benbenishty, 1986; Jones and Wessely, 2003; Solomon and Mikulincer, 2003) although some research suggests that outcomes are largely positive (Shlosburg and Strous, 2005).

The only previous UK longitudinal study of occupational outcomes following treatment by the FMHT was carried out with personnel who were based in Iraq post-2003 using early discharge from the Armed Forces as a proxy mental health outcome. The authors (Jones et al., 2010) concluded that organised mental health provision was effective in facilitating RTD although around a quarter of military personnel experienced a subsequent premature discharge from military service. This form of discharge was characterised by exit from voluntary military service before the minimum elective service term had been completed. Occupational fitness following mental health treatment may take many forms and is not necessarily restricted to premature separation from service in volunteer militaries. Military indiscipline in particular, has been shown to be associated with mental ill-health (Brewin et al., 2012; Hawton et al., 2009), along with a number of other negative occurrences including lack of career progression and demotion in rank.

Non-Deployed Tertiary Prevention

In the non-deployed setting, UK AF personnel with suspected mental health conditions who consult primary care doctors can be referred for specialist assessment at a military Department of Community Mental Health (DCMH). The DCMH provides both outpatient and peripatetic

clinics for military personnel serving in units within a defined catchment area. Both initial assessments and ongoing care are delivered which includes the provision of evidence-based psychological therapies and/or the prescription of psychotropic medication. Annually, only a small percentage of referrals (around 5%) require admission to hospital (Defence Statistics, 2014), which currently can be arranged through a specific contractual arrangement with a network of UK National Health Service hospitals. A central function of the DCMH is to contribute to the management of occupational fitness among military personnel suffering from mental disorders and other behavioural disturbances. In a minority of cases, this may lead to managed discharge from the Armed Services on mental health grounds.

Conclusion

The results of the systematic review suggest that the three levels of prevention are difficult to identify and define as discrete processes and procedures within the scientific literature. Rather, activity within the three levels of prevention has to be inferred from the characteristics of the particular intervention and its aims and objectives. This proved to be a challenge when carrying out the literature review. Furthermore, the quality of the literature is variable, with a minority of studies representing high level evidence such as randomised controlled trials, meta-analyses and systematic reviews while the majority of evidence comprises uncontrolled, non-randomised studies and observational data.

Rationale for the Programme of Research

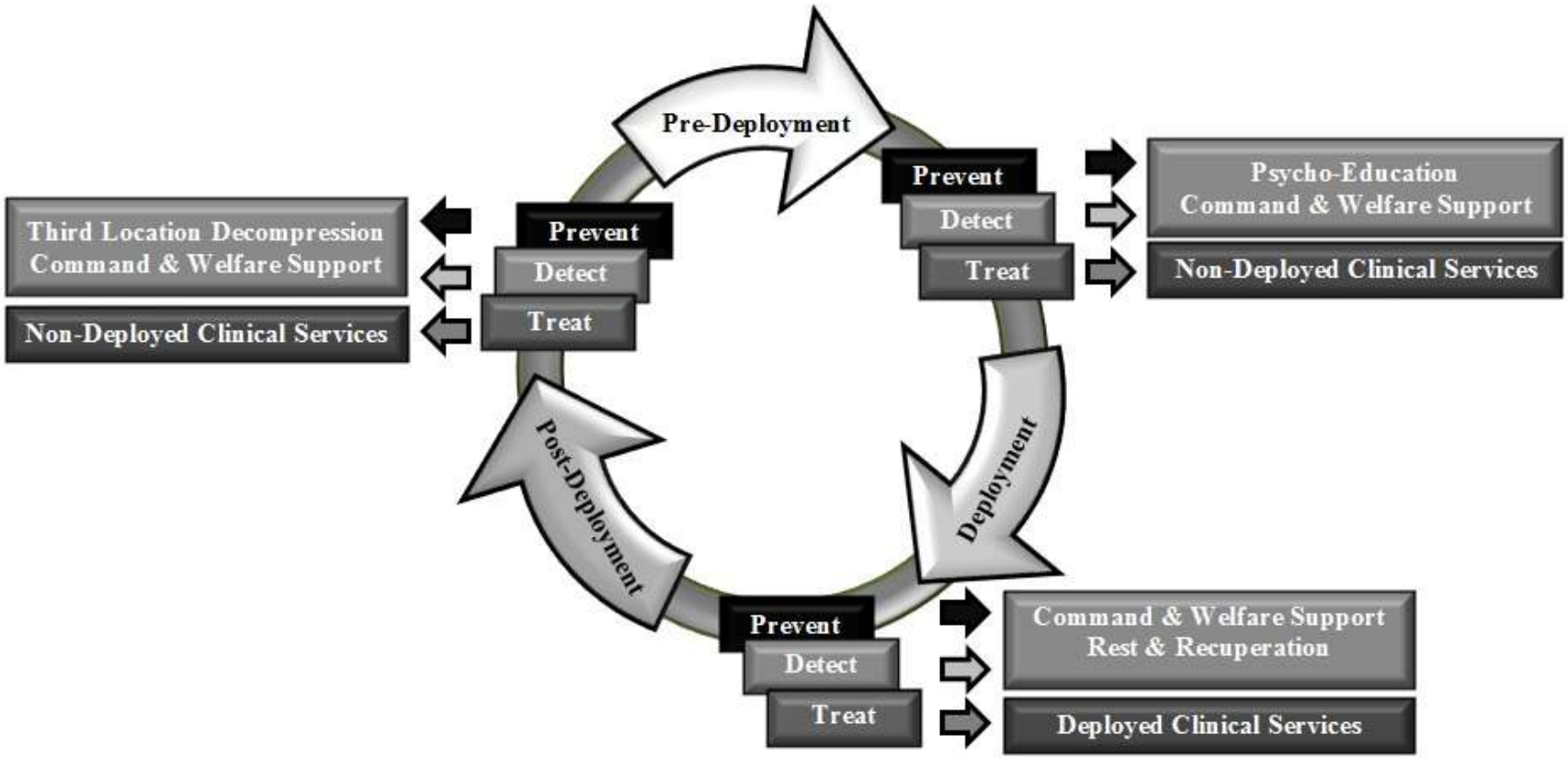
Currently, the published scientific literature lacks a unifying account of how the primary,

secondary and tertiary prevention model relates to the stages of the military deployment cycle. There are gaps in the knowledge base concerning the effectiveness of the various components of medical, operational and welfare support as they are currently delivered to UK AF personnel as they transit from peacetime to the operational setting and back again. There are no mental health outcome studies examining the mental health effects of both R&R and TLD and little is known about the effectiveness of clinical services delivered to UK military personnel with suspected mental disorder either in the deployed setting and particularly when they are preparing for deployment in their home base. To avail themselves of psychological therapy, military personnel must first recognise their symptoms and then engage with clinical services. The available literature suggests that help-seeking in a military context is infrequent and may be related to factors such as mental health stigmatisation, perceived barriers to care or failure to recognise that psychological symptoms constitute a problem requiring intervention.

The main aim of the proposed research is therefore to examine the effectiveness of the various mental health support strategies which are currently in place for UK military personnel as they navigate the various stages of the deployment cycle. In order to test the mental health impact of the various levels of prevention; primary, secondary and tertiary, this thesis will firstly examine the primary preventative mental health effects of R&R, command, general medical and welfare support in the operational area and TLD taken immediately post-deployment. To test the specific effects of secondary prevention, the impact of mental health stigmatisation and perceived barriers to care upon help-seeking will be explored so that stigma-reduction strategies can be proposed. Finally tertiary prevention will be explored by evaluating the effectiveness of clinical services as mediators of occupational fitness. A series of detailed recommendations will

be produced about improving prevention activity. Additionally, avenues for future research will be proposed. Figure 1. Graphically depicts the stages of prevention which constitute the various areas of research and how these relate to the deployment cycle.

Figure 1. Primary, Secondary and Tertiary Prevention During the Military Deployment Cycle



CHAPTER 3 - METHODOLOGY

Aim

Using a mixture of survey-based self-report and clinical interview-based data gathered from UK AF personnel as they prepared for, undertook and returned from operational deployment, a linked series of investigations were carried out which aimed to give a comprehensive account of the primary, secondary and tertiary preventative mental health measures currently utilised by UK AF military commanders. The choice of preventative strategies to be investigated was predicated on the literature review which indicated that little or no empirical evaluation of the psychological effects of the various interventions had been completed among UK AF personnel to date. Although each had different objectives, all of the interventions described in this thesis were concerned with the detection, prevention or treatment of military mental health problems and were delivered during three discrete stages of the military operational deployment cycle.

Objectives

Primary Prevention

To evaluate the effectiveness of primary prevention strategies, two distinct components of deployment related mental health support were investigated; firstly, the provision of a period of rest and recuperation taken during deployment and secondly, providing a period of structured rest as military personnel left the operational area. The interventions were investigated with two main objectives. Firstly, to evaluate whether taking a ten day period of rest & recuperation

(R&R) at home at some point during a six month operational deployment had any positive impact upon mental health and secondly, to investigate the psychological effects of attending a brief period of post-deployment structured rest known as third location decompression (TLD). This investigation also sought to establish whether attendance at TLD promoted better social re-integration of Service personnel when they returned home.

Although somewhat less well circumscribed and defined than R&R or TLD, general and family support provided by commanders, welfare support services and medical treatment services may well have had a part to play in directly influencing mental health levels and help-seeking for deployment-related and general psychological symptoms. Although not a mental health intervention per se, general support of this kind may have helped to promote better psychological health by fostering circumstances in which mental health can either flourish or where remedial interventions can be accessed. The third objective in relation to primary prevention was therefore to assess the effect upon help-seeking and mental health of three general support components, command, medical and welfare, as military personnel transitioned from preparation and training to deployment on combat operations and as they resumed their non-deployed duties.

Secondary Prevention

To investigate secondary prevention, surveys were conducted with two main objectives; firstly to estimate the extent of mental health symptoms among military personnel working in their home base whilst preparing for deployment, among personnel deployed and working overseas in the operational area and personnel who had completed their period of deployment and were returning to military steady state. The aim was to better understand the extent to which mental health symptom detection measures may be required and what level of risk reduction might be necessary. Having established the potential scope of the detection and risk-reduction requirement, the second objective came in two parts; firstly, to evaluate the potentially inhibiting effect of stigmatising beliefs about mental health and perceived barriers to care upon help-seeking; secondly to attempt to describe in detail the relationship between stigmatisation, symptoms of probable mental disorder and help-seeking. The reason for choosing stigma as a focus for research was that the detection of mental health symptoms must take place alongside remedial action which will hopefully restore those identified as requiring assistance to a state of mental health. Sometimes this may require non-medical risk-reduction activity, but it may also encompass strategies to engage those affected by symptoms with therapy or treatment delivered by military medical services in order to return them to a mentally healthy state. As described in the introduction to this thesis, one of the main theoretical obstacles to help-seeking is the presence of mental health stigmatisation. Although understanding the influence of stigmatisation is important to secondary prevention, as it may well interfere with detection and risk reduction, it clearly crosses secondary and tertiary prevention boundaries since, if military personnel seek early support and or therapy for emerging symptoms, they may be less likely to develop formal mental health disorders and may have better mental health outcomes if treated or managed early.

Tertiary Prevention

To investigate tertiary prevention, two main objectives were established; firstly, to evaluate whether the provision of formal mental healthcare delivered in the non-deployed setting had any substantial effect in promoting both short and long term occupational fitness and secondly to assess the occupational impact of providing deployed clinical services to UK military personnel working in the operational area.

Research Questions, Main Hypotheses and Methods

By way of a series of investigations which took place in a variety of military settings, this programme of research sought to assess a number of key mental health prevention measures. In relation to each level of prevention, primary, secondary and tertiary, a number of research questions were identified, hypotheses were generated and research methods were designed to evaluate them. This chapter is intended to give a broad overview of the research questions, hypotheses and methods employed in each component of the research programme. A detailed description of the use or adaptation of any survey items, outcome measures and any methods particular to the area of study is given in each of the chapters dealing with the component investigations.

Rational for the use of Common Measures

In order to ensure that similar mental health outcomes and general determinants of psychological health were being assessed within each component of the thesis and to allow for comparisons

across datasets, common scales, schedules or questionnaires were used wherever possible. Each of the common measures related to dimensions of mental health, or aspects of military functioning such as leadership, morale or cohesion. How and when they were utilised within each discrete study area is shown in Table 1. The cut-off points and adaptations used to delineate mental health caseness or substantial effects for each measure varied by study and are described in detail in later chapters. Additional measures were selected for their capacity to inform the area under investigation.

Table 1. Thesis Outcome Measures

MEASURE	STUDY AREA & CHAPTER						
	R&R (4)	TLD (5)	Non-Deployed Help-Seeking (6)	Stigma & Help-Seeking (7)	Operational Support (8)	Clinical Deployed (9)	Clinical Non-Deployed (10)
PTSD	PCL-C	PCL-C	PC-PTSD	PCL-C	PCL-C	Initial data based upon a clinical interview. Follow-up measures based upon information recorded in a personnel database.	Initial data based upon a clinical interview. Follow-up measures based upon information recorded in a personnel database.
Common Mental Disorder Symptoms	GHQ-12	GHQ-12	GHQ-12	GHQ-12	GHQ-12		
Multiple Physical Symptoms		52 Items					
Alcohol Use	*Audit-10	Audit-10	Audit-C	Audit-10			
Global Health (Short Form 36)	One Question	One Question			One Question		
†Mental Health Stigmatisation and Barriers to Care			Stigma 11 Items	Stigma 8 Items	Stigma 13 Items		
Discrimination (Reported/Intended Behaviour Scale)			4 Items				
Leadership				4 Items	4 Items		
Morale					4 Items		
Cohesion					4 Items		
Functional Impairment (Short Form 36)	One Question				One Question		
R&R Experiences and Satisfaction	Bespoke Scale						
Combat Experiences Scale	***17 Items	**13 Items		**17 Items	**17 Items		
Fear of Death or Injury	One Question						
Readjustment upon return home		4 Items					

Modifications:

*Two separate measures modified to assess the usual pre-deployment level of alcohol use and the level of alcohol use during R&R only.

**Seven items were retained from the original scale and the following items were amended to take account of language differences, specific current aspects of combat and difference in military techniques, tactics and procedures:

Items amended or deleted: being attacked or ambushed; responsibility for enemy combatant deaths; responsibility for non-combatant deaths; seeing human remains; seeing dead Americans; mine-clearing operations; seeing ill or injured civilians; experiencing a 'close call' and hand-to-hand combat.

Items inserted or amended to: giving aid to the wounded; experiencing a landmine strike; experiencing civilian hostility; Improvised Explosive Device strike; encountering sniper fire and not being able to respond to threats because of prevailing rules of engagement.

***Likert scale removed and replaced with a present/absent response scale. The modified 13 item scale was further amended to take account of the current combat mission in Afghanistan at the time of the study. Amended items included: a missile landed nearby but failed to explode; equipment shot off or saved by protective equipment; close quarter battle with a fixed bayonet; personally wounded or injured and saw sick or ill women or children but unable to help.

†Modifications to the stigmatisation and barriers to care scale are described in the various chapters utilising the scale

The Measures

General Measures of Mental Health and Military Functioning:

1. The intensity and extent of combat and operational exposure was assessed with variations of the *18 item combat and operational events scale* developed for use among US Forces (Hoge et al., 2004). Modifications to the original scale were undertaken to account for differences in the way that US and UK forces execute combat operations, language differences and items that became more or less relevant over the period of protracted combat deployments. The response scale consisted of five options which reflected increasing frequency of exposure. Responses were scored from 0 (no exposure) to five (exposure on 10 or more occasions). The amendments and modifications are shown in the Table 1 footnotes. The exposure scale is shown in full in the deployment mental health support survey in appendix 2.

2. Symptoms of common mental disorder (CMD) were measured using the 12 item *General Health Questionnaire (GHQ12)* (Goldberg et al., 1997). A psychometrically derived cut-off point was used to detect possible 'caseness' on this scale, where caseness indicated the potential presence of symptoms of mental health disorder. Each of the GHQ-12 scale items were rated on a four point scale, which generated item scores of 0, 0, 1 and 1 respectively. Scores were summated to give a potential range of scores from 0 to 12. A score of 4 or more indicated probable caseness levels of CMD.

3. Post-traumatic Stress Disorder (PTSD) symptoms were assessed using the *Post-Traumatic Stress Disorder Checklist Civilian Version (PCL-C)* (Weathers et al., 1994). The PCL-C has

17 items which were each rated using a five point scale. Each item was scored from one to five representing increasing symptom intensity to give a minimum score of 17 and a maximum of 85. Cut off scores ≥50 indicated probable caseness on this measure. The civilian rather than the military version of this scale was included in the various studies as it is the most commonly employed measure of PTSD in military research and would allow for comparisons to be made with both UK and international studies. In the non-deployed help-seeking study, the four item *Primary Care PTSD scale (PC-PTSD)* (Prins et al., 2004) was used to decrease the length of the survey and the associated burden upon respondents. Possible PTSD caseness on this measure was indicated by the presence of three or more symptoms.

4. Self-rated general health was assessed with one question from the *Medical Outcomes Study (MOS) 36-Item Short Form Health Survey (SF36)* (Mc Horney et al., 1993, Ware and Sherbourne, 1992). To assess subjective perceptions of health, a variable was generated for all studies that used the measure where individuals rating their health as fair or poor were compared with those rating their health as good, very good or excellent.

5. To assess functional impairment, one item from the *MOS SF36* gauged the impact of mental health symptoms upon day-to-day functioning (Ware and Sherbourne, 1992). This measure has been used in military studies to examine the impact of mental health symptoms upon personnel who perform safety critical tasks such as improvised explosive device detection, flying aircraft or providing medical support (Rona et al., 2009). For all studies, a binary variable was generated for the question 'If you experienced any [mental health problems] how difficult have these problems made it for you to do your work, take care of things or get along with other people?' Those reporting little or no impairment were

compared with those reporting that their difficulties were causing greater levels of impairment.

6. Where alcohol use and its effects were measured, these were assessed with the *10 item Alcohol Use Disorders Identification Test (AUDIT)* (Babor et al., 2001). The AUDIT is a validated questionnaire which indicates potentially hazardous, harmful and dependent levels of alcohol use. Responses were given to a 5-point scale which generated scores ranging from 0 to 4 for each of the 10 scale items thus yielding a minimum score of 0 and a maximum of 40. Scores ≥8 were used to indicate potentially hazardous alcohol use and scores of 16 or more indicated alcohol use that is potentially harmful to health. In one study, a three item variation, the *AUDIT-C* (Bush et al., 1998) was used decrease the burden of completing the survey for participants by reducing the length and complexity of the survey. The AUDIT-C is brief validated screening instrument used to identify potential alcohol use disorders using the first three questions of the 10 item AUDIT (Bush et al., 1998).

7. *Multiple Physical Symptoms (MPS)* were measured using a *53 item symptom checklist* first used in a cohort study of Gulf War veterans (Ismail et al., 1999) (Unwin et al., 1999) which was refined and used in phase one of the KCMHR cohort study of military personnel (Hotopf et al 2006). Cases of Multiple Physical Symptoms (MPS) were defined as the endorsement of 18 or more out of 53 symptoms representing the top decile of responses in phase 1 of the KCMHR cohort study.

8. *Stigmatising beliefs about mental health, help-seeking and barriers to care* were assessed using adapted versions of a 13 item measure developed for use in US military research (Hoge et al., 2004). The measure has subsequently been used in various forms when assessing help-seeking and potential barriers to care among UK military personnel (Osorio et al., 2012). Items comprising the 13 item version of the stigma scale were:

- Members of my unit might have less confidence in me
- My unit leaders might treat me differently
- I would be seen as weak by those who are important to me
- Seeking help would be too embarrassing
- If I sought help it would harm my career
- People with mental illness should not be given any responsibility
- I would think less of a team member if they receive MH care
- There would be difficulty getting time off of duty
- My visit would not remain confidential
- I don't know where to get help
- I don't trust mental health professionals
- My leaders discourage the use of MH services
- I have had previous bad experience of MH professionals

The response format and scoring method for the stigma scale varied by study and the strategy particular to each area of study is dealt with separately in each study chapter.

9. *Reported and Intended Behaviour Scale (RIBS)*

An abbreviated version of the Reported and Intended Behaviour Scale (RIBS) was used

(Evans-Lacko et al., 2011). Each scale item was endorsed using a five point Likert scale, indicating strength of agreement, scores of one indicated no agreement, representing high levels of potential discrimination, scores of three were neutral and scores of five indicated complete agreement, representing low potential discrimination. The four scale items were:

1. 'I would live with someone with a mental health problem'.
2. 'I would work with someone with a mental health problem'.
3. 'I would live nearby someone with a mental health problem'.
4. 'I would continue a relationship with someone with a mental health problem'.

The strategy for dealing with this scale is described in detail in the chapter describing the non-deployed help-seeking study.

10. *Leadership* was assessed using a four item measure developed for use among US military personnel (Castro et al., 1998, Castro and McGurk, 2004, Wright et al., 2009). This scale assesses perceptions of four dimensions of leader behaviour using a single question for each item. Responses were given to a five item Likert scale. The response options were never, seldom, sometimes, often and always and were allocated ascending scores; items one and two were reverse scored. For some studies where the measure was used, a binary variable was generated where the endorsement of three or more of the leader behaviours represented high levels of leadership and two or fewer indicated lower levels. The items comprising the leadership scale were:

(*Stem question*) 'During this deployment, my leaders…'

- Embarrass unit members in front of others

- Accept extra unit duties in order to impress their seniors

(*Stem question*) 'During this deployment, my leaders…'

- Treat all members of the unit fairly
- Show concern about the safety of unit members

11. *Cohesion* was assessed using a four item measure developed for use among military personnel (Wright et al., 2009). Responses were rated using a five item Likert scale ranging from strongly disagree through disagree, neither agree nor disagree, agree and strongly agree. Responses were rated using a five item Likert scale ranging from strongly disagree through disagree, neither agree nor disagree, agree and strongly agree using an ascending scoring format. The cohesion variable transformations used the same method as that used with the leadership variable. The chosen method is described in chapters dealing with individual studies. The items that comprised the cohesion scale were:

- I feel a sense of comradeship with others in my unit
- I am able to go to most people in my unit with a personal problem
- My seniors are interested in what I do or think
- I feel well informed about unit matters

12. *Morale* was assessed using a four item measure. The morale scale was scored and transformed in the same manner as the cohesion scale. The items that comprised the morale scale were:

- Morale within the unit has generally been high
- The unit has been motivated and enthusiastic
- The unit has been operating efficiently
- I have felt good about being part of this unit

The leadership, morale and cohesion scales are shown in the deployment health survey (Appendix 2).

Rest and Recuperation (R&R) Study Measure

R&R relates to a period of leave taken by many but not all military personnel during a protracted period of operational deployment. It is thought to be helpful as a mental health support measure but has never been evaluated in relation to this theoretical function. As no measures of R&R experiences exist, a measure was generated for the study and the process of constructing the measure is described in the chapter dealing with the rest and recuperation study. The scale is shown in full in appendix 2.

For the deployed and non-deployed healthcare studies, no psychometric scales were used. Instead, real-world measures of occupational outcome were used. These are described in the chapter dealing with the studies.

General Analysis Strategy

For each of the research areas, categorical variables, including socio-demographic, operational and military characteristics, mental health factors and variables were initially explored using Pearson's chi squared (χ^2) test to establish significant associations. The minimum level of statistical significance was maintained at $p \leq 0.05$ throughout.

Investigation of significant associations was carried out using univariable and multinomial logistic regression to generate odds ratios (ORs) with 95% confidence intervals (CI). ORs

and CIs were adjusted for a range of potential confounding variables that were selected a priori for their known or hypothesised association with the independent variables under investigation. Additional analyses were based upon the characteristics of the variables being explored and are summarised in the sections dealing with each of the thesis components below and in detail in each of the study chapters.

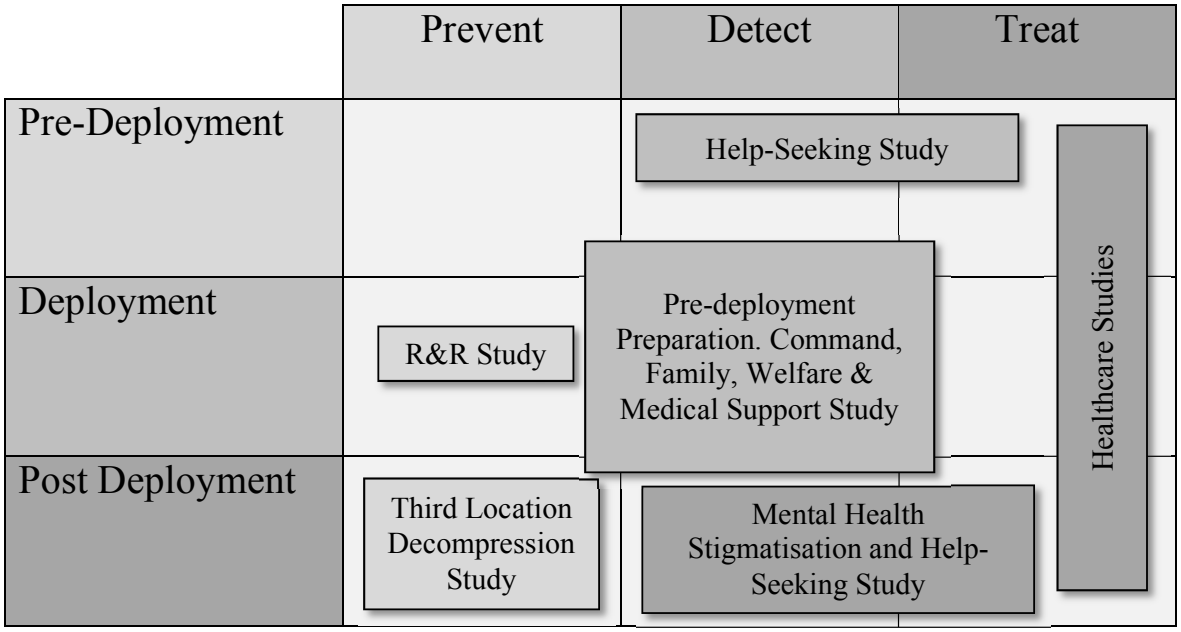
In some studies, variables were rank ordered using the results of the Wald test statistic and associated significance level. The Wald test is a method used for testing the significance of explanatory variables within a statistical model. In each instance where it was used, the test statistic and associated *p* value is shown.

In the instances where correlations were assessed, as data were not normally distributed and could not be transformed to a normal distribution, Spearman's rho was used to assess variables of interest.

Thesis Study Elements

Each of the proposed study components were carefully assessed for their feasibility prior to embarking on the programme of research and were designed to test each component of prevention, namely, primary prevention (*prevent*), secondary prevention (*detect*) and tertiary prevention (*treat*). The main aim of the thesis was to evaluate a prevention component during each of the three phases of deployment, namely pre, during and post-deployment. Some study components spanned the phases of the deployment cycle and the theoretical boundaries of prevention activity. A graphical representation of the proposed programme of study is shown in Figure 2.

Figure 2. Thesis Components Overview



Studies Comprising the Thesis

Chapter 4 - Primary Prevention During Deployment - Rest and Recuperation (R&R)

The first research question related to the potential primary preventative mental health effects of taking a period of R&R during operational deployment. The hypothesis tested was that symptoms of common mental disorder (CMD) and posttraumatic stress disorder (PTSD) would be similar among military personnel about to embark upon a period of R&R to those reported by personnel as they finished their R&R. The secondary objective of this study was to describe the factors which were statistically significantly associated with dependent variables which included mental health symptoms and alcohol misuse. Independent variables included operational exposures, socio-demographic factors, deployment and military characteristics and R&R experiences identified through principle component analysis which is described in detail in the R&R study chapter.

The mental health measures used in this study were a modified AUDIT-10, the GHQ-12, PCL-C and two single questions relating to perceived global health and impairment arising from mental health disorder symptoms. The modifications to the AUDIT are described in the chapter dealing with the R&R study. In addition to gathering socio-demographic and military characteristic information, the survey contained a modified combat exposure scale assessing 17 operational experiences and an additional single question regarding perceptions of impending death or serious injury.

Principle component analysis (PCA) was conducted to further reduce the R&R experiences scale to key constituents so that associations between the PCA derivatives, representing discrete aspects of R&R, and the mental health outcome measures could be assessed. The associations between independent categorical variables, including socio-demographic, operational and military characteristics, mental health, and ratings of R&R experiences were assessed using the general analysis strategy described at the beginning of this section. The measures used in this study are summarised in Table 1.

Chapter 5 - Primary Prevention Immediately Post-Deployment - Third Location Decompression (TLD)

The second research question related to the primary preventative mental health effects of immediate post-operational mental health support; the question was, does TLD have a beneficial effect upon mental health and does it help to improve psycho-social re-adjustment following return from deployment? Two research hypotheses were tested; first, personnel attending TLD following operational deployment would report similar levels of symptoms of CMD, PTSD, global health, multiple physical symptoms and would experience similar levels of alcohol misuse to personnel who did not attend TLD. The second hypothesis was that

personnel attending TLD would experience similar levels of psycho-social re-integration upon return to their home base to those who do not attend TLD.

Hypotheses were tested by comparing mental health and post-deployment re-adjustment outcomes among a group of military personnel who received the TLD intervention with those in a no intervention group. To achieve this, data gathered as part of the ongoing military cohort study conducted by the King's Centre for Military Health Research (Hotopf et al., 2006, Fear et al., 2010) were examined. A sub-section of the cohort survey asked whether personnel had attended TLD or not when it was available. With sample weights applied, the profile of the initial sample was broadly representative of UK AF personnel who were in service at the time of the deployment to Iraq in 2003 and a later sample was broadly representative of those personnel who were in service as continued deployment to Iraq or Afghanistan took place. It was therefore possible to make tentative extrapolations from research findings based on these samples and the whole UK military force. The TLD study compared the responses of those who provided data at both the initial and follow-up survey points. Preliminary exploration of the datasets suggested that at least 2500 subjects were suitable for inclusion in the TLD study.

In addition to the standard mental health measures, social re-adjustment was assessed using four directly relevant questions relating to potentially problematic homecoming extracted from 11 questions contained in the KCMHR cohort survey which enquired about repatriation experiences. The 're-adjustment scale' is described in detail in the methods section of the TLD study chapter. To assess the psychological effect of the intensity and extent of operational experiences, the study sample was stratified by combat exposure level which was generated from the 13 item version of the combat experiences scale.

The TLD study used observational data collected primarily for a large epidemiology study rather than for intervention studies. This restricted the ability to infer whether TLD had differential effects among those attending or not attending TLD. The gold standard in any intervention study is the use of randomisation and a control condition, however, such procedures were not feasible as TLD was mandated for the vast majority of personnel returning from Afghanistan at the time that the study was proposed. A procedure has been developed to allow for observational data to be analysed in such a way that some characteristics of a randomised controlled trial are mimicked and inferences about the contribution of an intervention to an outcome can be made. Propensity score matching is such a procedure which can only be implemented when a dataset is fully or almost fully populated. As the TLD dataset was well populated with few missing fields, propensity score matching was used to pseudorandomise data in order to minimise potential sources of bias. A detailed description of the use of propensity score matching and the subsequent analysis strategy is given in the TLD study chapter.

Chapter 6 - Primary Prevention During Deployment - The Mental Health Effects of Pre-Deployment Mental Health Briefing, Command, Family, Medical and Welfare Support

The third research question related to elements of primary and secondary prevention activity carried out during deployment. In this context, primary prevention took the form of pre-deployment preparation and subsequent command, medical, family and welfare support; medical and command support encompassed elements of secondary prevention. The research question related to the effectiveness of three distinct support components; firstly, what were the mental health effects of receiving psycho-education in the form of a stress management

briefing prior to deployment? Secondly, are levels of psychological health measured during deployment related to general medical support, perceived provision of support for families at home and welfare activity? Thirdly, is there a psychological benefit to be gained from experiencing effective command exemplified by good leadership while deployed on operations? Three main hypotheses were tested; firstly, levels of CMD and PTSD would be similar amongst personnel who received a pre-deployment mental health psycho-educational brief and those that did not. Secondly, mental health effects would be similar among those who perceived that their families received satisfactory levels of support provision while they were deployed versus those personnel who perceived that their families received inadequate or no support. Thirdly, psychological outcomes would be similar among those who rated their leader's behaviour in a positive manner and those who perceived that their leaders were less effective during deployment.

A combined dataset derived from two surveys conducted whilst personnel were deployed in Afghanistan in 2010 and 2011 was analysed. Preliminary examination of the two datasets suggested that there were sufficient similarities among the variables to allow for a direct comparison between the two periods of deployment and to provide for a robust evaluation of the various primary prevention strategies using the combined dataset while adjusting for the year that data were collected. Mental health outcomes were compared using various support components as independent variables and a range of socio-demographic, military and deployment factors as potential confounding variables. Both surveys utilised the core mental health measures including the GHQ-12 and the PCL-C which represented the dependent variables. Functional impairment, subjective global health and stigma were also assessed. Operational exposure was measured using a modified 17 item version of the combat experiences scale. Subjective impression of leadership, morale and cohesion was assessed

using the standard four item measures. Pre-deployment preparation in the form of receipt of a stress management brief, perceptions of family support at home and actual use of deployed medical and welfare support were all assessed with single questions. The various methods of transforming, summating, or categorising responses to the various scales are described in the chapter detailing the deployment mental health support study. The scales utilised in the study are summarised in Table 1.

The operational datasets were powered using known prevalence rates for common mental disorder among military personnel measured using the GHQ-12. The surveys aimed to detect a common mental disorder symptom prevalence of 18-22% with a confidence level of 95% among 15% of the military force deployed in Afghanistan at the time that the two surveys were to take place. To achieve this, a minimum sample size of 733 members of the deployed force was required; approximately 1400 personnel were sampled during the first survey and just under 1400 personnel during the second.

A standard approach to analysis was taken where chi squared tests were initially conducted to explore the datasets. Unadjusted and adjusted univariable and multi variable logistic regression was then used to further explore significant associations. Dependent variables included being a mental health case on either the PTSD or CMD measure using the standard cut-off scores, subjectively experiencing poorer or better subjective global health, greater vs. lesser functional impairment and lesser vs. greater levels of stigma and perceived barriers to care related to mental health and help-seeking. In addition to the year of deployment, predictor variables were adjusted for a range of potential confounding variables which are described in detail in the chapter dealing with this study. Trends in the data were examined using chi-Squared (χ^2) test for trend.

Chapter 7 - Secondary Prevention in the Non-Deployed Setting – Mental Health Stigmatisation, Symptoms and Help-Seeking

The fourth area of research related to secondary prevention and sought to identify the main factors associated with seeking support or help for mental health difficulties in a non-deployed setting; the non-deployed setting in this case relates to the period of re-constitution and training undertaken in the home garrison prior to further periods of operational activity. The specific research question was whether actual help-seeking and interest in receiving help was related to prevailing beliefs about mental health and seeking support. The hypothesis tested was that levels of help-seeking in a non-deployed setting would be similar among military personnel reporting higher levels of perceived stigmatisation regarding mental health, help-seeking and related barriers to care (stigma/BTC) to those reporting lower levels of stigma/BTC. The secondary aim of the research was to define the role of current mental health symptoms in modulating the decision to seek help. The intention was to generate recommendations for improving the engagement of military personnel with psychological symptoms with potential sources of help.

An intervention study provided secondary data for this element of the thesis, however, evaluating help-seeking, stigmatisation and mental health was always a planned secondary objective of the primary trial. Data were provided by a randomly chosen sample of Army personnel participating in a comparative study assessing the impact of a stigma reduction strategy using a comedy show as the means of delivery. The help-seeking and related questions were embedded in the baseline element of the comparative study to facilitate an evaluation of changes in help-seeking pre- and post-intervention. During the initial study design, the questions were crafted in such a way that secondary data could be generated to

assess levels of current help-seeking and their relationship to a range of beliefs about mental health. The main outcome measure used in the evaluation of the stigma reduction intervention was the stigmatisation and barriers to care scale described in the thesis introduction. A stigma/BTC frequency of around 60% has been demonstrated among military personnel in previous studies (Osorio et al., 2012) and the intervention study was powered to detect a post-intervention change of plus or minus 5% in the rate of reporting one or more stigma scale item(s) with 95% confidence among 212 subjects in the intervention arm. There was an intervention and a control group in the comparative study and the final sample size was comprised of 484 personnel who provided comprehensive baseline data prior to the intervention. Only the baseline data were used in this thesis component, so the intervention did not introduce a potential source of bias into the current study. A cross-sectional design was chosen as the stigma reduction intervention had a significant anti-stigma effect both post-intervention and at follow-up in the primary trial. Furthermore, the study samples undertook operational deployment before the planned follow-up assessment and response rates were quite low. A second stigma/BTC and help-seeking study, which is described below, used post-deployment data to provide longitudinal outcomes for this thesis.

As the outcome measures for the intervention study were extensive, brief survey measures were chosen wherever possible to reduce the bulk of the survey in order to make completion less onerous for participants. After enquiring about socio-demographic, military and operational characteristics, current levels of alcohol use were assessed with the three item Alcohol Use Disorders Identification Test (AUDIT-C)'. For this study, symptoms of PTSD were assessed using the four item PC-PTSD and symptoms of CMD were assessed with the standard measure, the GHQ-12. To gain an in-depth understanding of military personnel's view of their personal role in managing psychological symptoms and whether they viewed

themselves as having responsibility for their mental health, further questions that have been shown to be important in previous research were added to the modified 11 item version of the standard stigma/BTC scale and are described in full in the non-deployed help-seeking chapter. Other questions related to interest in receiving support and actual help-seeking activity. Potential discriminatory beliefs relating to mental illness were assessed using the reported and intended discrimination scale (RIBS) (Evans-Lacko et al., 2011). Help-seeking behaviours, help-seeking intentions and interest in receiving support were assessed using multiple questions. Comparisons were made between those seeking help from medical and non-medical sources. The effects of mental health stigmatisation, perceived barriers to care and potential mental health-related discrimination upon rates of help-seeking were evaluated.

The standard analytic strategy was used to evaluate study data, however, in addition to assessing the effects of a range of independent variables using chi squared tests, unadjusted and adjusted regression analyses, a receiver operating characteristic curve was generated using current study participant's AUDIT-C responses and the responses of a large representative sample of military personnel who had completed the ten item AUDIT to establish the optimal cut-off score for the abbreviated alcohol measure used in the current study.

Chapter 8 - Secondary Prevention in the Early Period Following Return from Deployment - Mental Health Stigmatisation, Symptoms and Help-Seeking.

The fifth research question related to secondary prevention which was assessed in a sample of personnel who had recently returned from operational deployment, a later phase of the deployment cycle. The research question posed in this element of the thesis was similar to

that asked in the non-deployed setting, however, help-seeking activity, intention to access support and the psychological effects of stigmatisation and perceived barriers to care were evaluated on the first day after leaving the operational deployment area and participants completed further follow-up measures some six months later. Given the longitudinal nature of the dataset, the hypothesis tested was that symptoms of probable mental disorder would be similar among those reporting higher and lower levels of stigma/BTC at both assessment points. The second research question was whether levels of stigma/BTC would have any substantial effect upon help-seeking behaviour.

For this study element, data were examined which had been provided by approximately 1600 personnel who took part in a randomised controlled trial of a post-deployment mental health intervention after having deployed to Afghanistan in 2008 to 2009. In addition to a sub-section measuring the main effects of the intervention study, discrete sub-sections of the survey dealt with help-seeking behaviour and intent and mental health stigmatisation and barriers to care. Changes in levels of stigmatisation over the follow-up period were compared in those developing new mental health symptoms, in those entering remission, and among personnel who maintained minimal symptoms or none at all. The effect of varying levels of psychological symptoms and stigma/BTC upon help-seeking behaviour and intent were assessed.

Mental health outcome measures for this thesis element were representative of the standard array described above. A modified 8 item mental health stigmatisation and barriers to care scale and the standard mental health measures were used, namely the GHQ-12 and PCL-C; all of these measures were administered at baseline and follow-up. The stigma/BTC scale modifications are detailed in the chapter describing this study element. Personnel were asked

to respond to a single question which asked if they had experienced a stressful, emotional, relationship or family problem at any time either during deployment or following the return home. They were further asked if they had sought help for any such problems and about the source of any support provided. Perceived alcohol problems were assessed at follow-up only, at which time the AUDIT-10 was administered. Personnel were not asked about alcohol use at the initial post-deployment evaluation as alcohol use is forbidden during deployment.

The analysis strategy used exploratory chi squared tests and adjusted univariable and multinomial logistic regression analyses to assess whether changes in mental health status were associated with corresponding changes in stigmatisation and perceived barriers to care over the follow-up period and whether either impacted upon help-seeking behaviour, interest or intent.

Chapter 9 - Tertiary Prevention - Occupational Fitness and Clinical Care in the Deployed Setting

Data for the deployed clinical study were gathered during mental health assessments over a period of four years. The assessments were conducted among UK AF personnel referred to the deployed Field Mental Health Team (FMHT) for psychological evaluation while serving in Afghanistan. Following in-depth mental health interviews, clinicians recorded their initial findings in an electronic database along with subsequent clinical input and whether the referred person returned to their deployed unit or if they were evacuated home. Mental disorder categories were derived from in-depth clinical assessments rather than through the administration of psychometric scales and measures.

To assess the effects of tertiary prevention among deployed personnel, both short and longer-

term occupational fitness rates following assessment and or clinical care were evaluated. Study subjects were military personnel who either became mentally unwell during their period of deployment or were referred when their behaviour gave cause for concern to those around them. Based upon the outcomes described in a previous study of deployment mental healthcare (Jones et al., 2010) two research questions were generated. The first related to short-term occupational fitness and sought to assess whether management by the FMHT, using the principles of forward psychiatry[1], could return around three quarters of personnel to their operational unit where they would remain to complete their operational tour. The second research question related to longer-term occupational fitness, where it was hypothesised that, based upon previous study findings, around three quarters of military personnel treated by deployed military mental health teams would continue to experience full occupational fitness at any time during the four years following their return from deployment. Secondary objectives were firstly, to evaluate the occupational effects of being referred by way of a range of sources. Self-initiated or chaplain referrals were deemed to represent an easier and less occupationally risky pathway into mental healthcare than the route associated with consulting a welfare provider, military doctor or commander[2]. Secondly, the study sought to describe the predictors of reduced longer-term occupational fitness following completion of mental health assessment or therapy.

Following mental health assessment, demographic and military data, referral source, subsequent treatment and short-term occupational outcome were recorded in the deployment electronic database. Specific areas were assessed, such as aspects of the operational environment, adjustment to being deployed and self-reported combat exposure. In order to assess whether the clinical sample had any unique properties, the characteristics of personnel

Forward Psychiatry relates to the practice of providing mental health treatment as close to the place of work as possible and utilises the principles of proximity (treatment close to the military unit), immediacy (treatment initiation as soon as practically possible, expectancy (creating the expectation of an early return to the workplace) and simplicity, which relates to the delivery of uncomplicated interventions.

[2] Military doctors and unit commanders can impose functional restrictions upon personnel who they deem to be a substantial workplace risk.

referred to the FMHT were compared with whole force personnel characteristics. To determine longer-term occupational outcome over a four year period, data linkage was carried out under an ethically approved data sharing agreement between the clinical dataset and markers of occupational functioning recorded in a personnel database maintained by Defence Statistics, an organisation that compiles personnel and other military data that can be made available for research purposes. The occupational markers are described in detail in the chapter dealing with this study. To broaden the assessment of occupational functioning, indirect indicators of poorer military occupational functioning were examined, including serious disciplinary infringements and discharge from the Armed Forces; positive outcomes were assessed including deployment on combat operations and promotion following the mental health intervention.

Among approximately 550 referrals around 90% of the clinical records contained a documented short-term occupational fitness marker and following data linkage, longer-term occupational outcome markers were available for around 80% of referrals.

The standard analytic strategy for categorical data was employed using exploratory chi squared tests with unadjusted and adjusted logistic regression to explore significant associations among the data and trends in the data over time were examined using chi squared ($\chi 2$) tests for trends.

Chapter 10 Tertiary Prevention - Occupational Fitness following Clinical Care in the Non-Deployed Setting

The final research question related to tertiary prevention which took the form of

psychological assessment and treatment delivered to military personnel in the non-deployed setting. The study sought to establish the occupational impact of providing mental health assessment and/or clinical care to military personnel who develop potential mental disorder symptoms or behavioural disturbances while working in their home base. As described earlier, occupational functioning was chosen as an outcome as this is a routinely recorded, real-world marker of an individual's general functioning. Occupational data are regularly gathered over a protracted period of time, whereas mental health measures were not available for all participants and when collected, they were entered into different systems using varying methods and formats. Occupational measures therefore represented a consistent, standardised outcome.

Based upon published rates of return to duty among military mental health patients, the hypotheses to be tested in the non-deployed setting were that clinical intervention delivered by military mental health services would return at least 75% of personnel referred with mental health problems to work with no medical restrictions (Gould et al., 2007). Secondly, mental health treatment delivered by military clinicians in a non-deployed setting would promote long-term occupational fitness for role in around 80% of personnel (RAF Health Report, 2013). The secondary objective was to describe the predictors of both short and longer-term occupational fitness following discharge from military mental healthcare.

Occupational fitness was represented by the individual's medical employment standard, which is assessed by a doctor and governs a military person's employability in the context of any prevailing health conditions. As described in the thesis introduction , it is a marker of the ability to deploy given the current state of an individual's mental and physical health. In addition to medically imposed restrictions, discharge from service for medical reasons was

incorporated into this category. In the non-deployed setting, occupational fitness was assessed and recorded upon discharge from clinical care conducted in military departments of community mental health (DCMH) and was then recorded in personnel databases at various points in the following months and years. Clinical, socio-demographic and military data were routinely gathered by therapists working in the DCMH. Socio-demographic, military, clinical data and therapy characteristics represented independent variables while medical category on discharge following completion of the episode of care represented the dependent variable. To establish longer term occupational fitness in the form of the current medical grading or medical discharge, using the same method as the deployment healthcare study, the clinical database was linked to a personnel database under a data sharing agreement.

The non-deployed dataset contained approximately 3050 complete clinical records, a proportion of which related to re-referral episodes. A record of longer-term occupational outcome was available for 1205 individuals.

Data were recorded by community based mental health therapists carrying out mental health assessments in a purpose designed electronic database. For clinical and therapeutic factors, treatment was categorised as either assessment only or a combination of other forms of support and psychological therapy. Therapy was coded as brief, intermediate or prolonged according to the number of sessions delivered and therapy was further categorised as being delivered by a single therapist or with input from a multi-disciplinary team. Clinical data included current and historical acts of deliberate self-harm (DSH), current levels of alcohol use, co-morbidity of mental disorder and hazardous or harmful alcohol use, past referral for psychiatric assessment and clinical diagnosis which was generated using International Classification of Mental Disorders Version 10 criteria (ICD 10) (World Health

Organisation.1992). These data were used to assess the association of personal, military, clinical and therapy factors with both short and longer-term occupational fitness. As the outcome data were longitudinal, it was possible to make causal inferences.

The analytical strategy used the standard approach of exploratory chi squared analyses and unadjusted and adjusted logistic regression described earlier in this chapter. In addition, interaction terms were created for specific variables of interest and were used as predictor variables in the regression analyses. Trends over time were assessed with chi squared tests for trends. As longer-term data were missing for a substantial number of personnel, the characteristics of personnel with missing data were explored and the factors that were found to be significantly associated with data non-availability were examined using multinomial logistic regression. Response weights were then calculated and applied to the dataset prior to conducting the analyses of longer-term occupational fitness, the procedure for calculating the weights is described in the non-deployed clinical study chapter.

CHAPTER 4 - PRIMARY PREVENTION - THE PSYCHOLOGICAL IMPACT OF OPERATIONAL REST AND RECUPERATION (R&R)

Overview

This chapter describes a study which sought to evaluate the mental health effects of R&R, which is a short period of leave taken by UK military personnel at a home location during a six month duration overseas operational deployment. The aims of the study were to examine whether the provision of R&R functioned as a primary preventative measure taken to provide respite from adversity and to improve mental health for deployed personnel when they returned to the operational area. The second aim was to identify which, if any, elements of R&R were significantly associated with deployment mental health. Two samples of military personnel were surveyed. All participants completed measures of mental health and alcohol use and a post-R&R sample reported upon their experience of R&R upon completion of their time at home; 304 personnel were surveyed as they embarked upon R&R and 232 as they returned to the operational area. 42 subjects were surveyed at both points. Overall, 11.5% of all respondents reported substantial symptoms of CMD, endorsing ≥4 symptoms on the GHQ-12; the rates were 11.2% in the pre-R&R survey group and 12.1% in the post-R&R group. 3.2% reported symptoms of probable PTSD, scoring ≥50 on the PCL-C; the rates were 2.7% in the pre-R&R survey group and 3.7% in the post-R&R group. 46.9% of personnel (n=135) scored at or above the cut-off point for hazardous use of alcohol on the modified AUDIT-10 prior to deployment and 50.0% (n=110) reported similar levels of use during R&R. The levels of probable CMD, PTSD and hazardous alcohol use were not significantly different between the pre and post R&R groups. In those assessed pre- and post-R&R, mean mental health symptom and AUDIT scores were not significantly different.

Approximately 90.0% of those returning to the operational area expressed strong satisfaction with the overall experience of R&R. Principle components analysis of the R&R experiences scale generated five factors; engaging with or deriving satisfaction from each of the five factors was associated with better mental health when returning to the operational area and lower levels of alcohol use during R&R. There was a positive general mental health and alcohol effect among those personnel who were better able to engage with certain aspects of the R&R process.

Introduction

As detailed in the introductory chapter, given the paucity of information about work recuperation generally and the mental health effects of taking R&R among UK military personnel specifically, the main aims of the current study were to examine whether taking R&R led to improved mental health for military personnel when they returned to the operational area and to identify the elements of R&R that were associated with deployment mental health. Whilst the findings were derived from a sample of military personnel, it is suggested that the study outcomes may have implications for other organisations that deploy their staff away from home for prolonged periods of time.

Study-Specific Methods

R&R Experiences

After conducting a literature review and using the Recovery Experience Questionnaire (Sonnentag and Fritz, 2007) as a template, initial focus groups were conducted by a colleague

to establish survey content amongst two groups of 12 infantry soldiers who had recently taken R&R. After constructing the scale and testing it for comprehension among a small sample of soldiers, content validity was established using Chronbach's alpha which was .84 for the full scale. The final measure consisted of 30 items which were rated using a 4 point Likert scale broadly indicating strength of agreement, satisfaction and quality (Parsloe et al., 2014). The full R&R Experiences Scale is shown at Appendix 1 and the method of administration is described at the end of this section.

Principal Component Analysis (PCA) of the R&R Experiences Scale

To prepare the R&R experiences scale for analysis, the final five scale items (numbers 25-30) were removed before data entry as they related to satisfaction with the overall experience of R&R rather than being about discrete facets of R&R. The remaining 25 items were entered into the analysis. The oblique promax rotation method was selected as the number of subjects who had completed the measure was sufficiently large and a manual inspection of the correlation matrix suggested that the majority of the R&R experiences scale items were correlated; this method gives the optimal solution when data have these characteristics. As the sample size exceeded 200 (n=227), in accordance with Kaiser's criterion for factor extraction (Kaiser, 1960), all factors with eigenvalues >1 and individual R&R scale items with 10 or more factor loadings >0.40 were retained in the model. Although this is not necessarily a problem when conducting PCA (Field. 2013), multicollinearity was assessed and found not to be present, (determinant of the *R* matrix >0.00001). The Kaiser-Meyer-Olkin measure of sampling adequacy was 0.79 indicating that the sample size was sufficiently large to allow for a robust PCA. Bartlett's test of Sphericity indicated substantial

relationships between the variables used to perform the PCA ($p<0.001$). All off-diagonal values in the anti-image matrix had p values >0.5 so none were deleted.

Following examination of the scree plot (Cattell, 1966), (Figure. 3), the point of inflection appeared to fall around the sixth extracted factor; the first five components were therefore selected for retention (Table 2). The retained components explained 61.2% of the overall model variance. All components contained a minimum of two items and all had factor loading coefficients ≥.50.

Figure 3. Scree Plot – R&R Component Eigenvalues

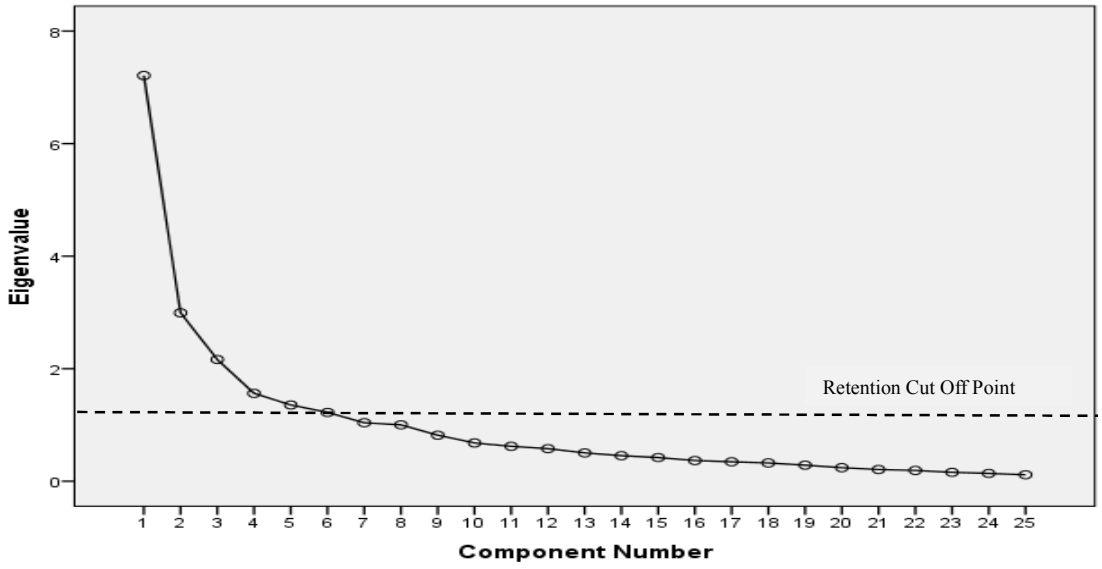


Table 2. Five Component PCA Solution for the R&R Scale, Component Eigenvalues and Percentage of Model Variance

R&R Survey Component Label	Items (n)	Eigenvalue	Variance (%)
Mental Disengagement from Events in Afghanistan	5	7.21	28.8
Rest and Social Support	5	2.99	12.0
Travel from Afghanistan	2	2.16	8.7
Physical Recovery	3	1.56	6.3
Relaxation	4	1.36	5.4
Overall % of Model Variance	19		61.2

Table 3 shows the composition of the five item solution with pattern matrix coefficients.

Table 3. R&R Component Composition and Pattern Matrix Coefficients

Components and Component Items	Component Number and Coefficient				
	1	2	3	4	5
1. Mental Disengagement from events in Afghanistan					
I did not think about work at all	.98				
I could switch off and did not think about what was happening in Afghanistan	.89				
I did not worry about work or my unit back in Afghanistan	.82				
I forgot about work	.80				
I did not try to get news about Afghanistan	.70				
2. Rest & Social Support					
I got as much support as I wanted from friends and family		.87			
On R&R I felt close to the people that matter to me		.85			
I could do leisure activities that I enjoy		.56			
I could do relaxing things		.54			
I was able to get a good night's sleep		.50			
3. Travel					
How would you rate your experience of the journey back to the UK?			.97		
Overall, how satisfied are you with your experience of travelling back to the UK?			.94		
4. Physical Recovery					
It was difficult to kick back and do nothing at home				.82	
I did not feel close to my family/friends on R&R				.77	
The journey back to the UK had a negative impact on my experience of R&R				.68	
5. Relaxation					
I got a break from the physical demands of being on tour					.82
I could relax and switch off from feeling in danger					.79
I saw family and friends					.50
I got as much support as I wanted from my family/friends					.50

Survey Content

The survey asked about socio-demographic, operational and military factors. The questionnaire contained a removable section where personal information could be entered however, personnel were advised that they could complete the questionnaire anonymously if

they chose not to record identifiable details, in this case, to allow for later data linkage, a unique number was allocated and recorded which was known only to the researcher and the subject.

As described in the general methods section, exposure to 17 combat and operational events (Hoge et al., 2004) was assessed. For this study, the scale was reduced to a dichotomous response format for each scale item; each item was rated as exposure experienced or not experienced. Normally, this scale has a graded frequency response format, however, for this study, presence or absence was judged to be a sufficient indicator of exposure and simplification of the study measures was sought wherever possible to reduce the burden of completing this complex survey. Scores for the 17 combat exposure scale items were summated and tertiles were computed. A dichotomous variable was produced where scores falling above the upper tertile were compared with those falling below the middle tertile. In addition, personnel were asked to endorse a single item regarding perceptions of impending death or serious injury which was rated from never through once or twice, sometimes and many times.

Harmony Guidelines were assessed. Although there are small differences in how Harmony duration is calculated between the three branches of the Armed Services, the guidelines generally state that individuals should not exceed around 13 months of cumulative separated service in any continuous period of 30 months. It was felt to be important to assess adherence to the guidelines as research suggests that breaches of Harmony Guidelines are associated with negative mental health outcomes (Rona et al., 2007).

As described in the general methods chapter, mental health outcomes measured in this study were common mental disorder, PTSD symptoms and associated functional impairment. In order to assess the overall mental health effect of R&R, a composite variable was generated combining the PCL-C with a cut off score ≥50 and/or a GHQ-12 score ≥4.

Alcohol use was measured using the 10 item AUDIT questionnaire. Consumption of alcohol is prohibited during deployment; the AUDIT was therefore modified so that at Time 1, personnel rated their average level of alcohol use in the year prior to deployment to gauge their usual pattern of drinking. At Time 2 personnel rated alcohol use during R&R. Subjective health was rated from poor through excellent using a five point Likert scale. Responses were dichotomised by combining 'poor' or 'fair' subjective health and comparing these against combined 'good', very good' or 'excellent' responses.

The R&R experiences scale was administered at Time 2 only. Response options were reduced to a binary format by combining strongly agree and agree responses and disagree and strongly disagree responses; where quality was rated, good and excellent responses were grouped together and compared with poor ratings; for satisfaction-based responses, very and mostly satisfied responses were grouped and compared with mostly dissatisfied responses. To gauge the overall level of satisfaction with R&R, positive endorsements of each of the five general satisfaction items were summated and a dichotomous variable was generated which compared four to five positive responses, representing high levels of satisfaction with zero to three positive responses, representing moderate to low levels of satisfaction. The R&R scale was sub-categorised into components identified in the PCA and percentiles were generated for each of the five components to examine the association of various levels of endorsement of the component categories with mental health and alcohol outcomes.

Survey Timings and Schedule

The survey without the embedded R&R experiences scale was administered to a sample of personnel as they arrived in the UK to take R&R whilst undertaking deployment to Afghanistan in 2011 (Time 1). A second group completed the baseline survey plus the R&R experiences scale on completion of R&R (Time 2) and a smaller group were surveyed as they arrived to take R&R and then again as they returned to the operational area some 10-14 days later having completed R&R. It was intended that a matched sample would be assessed, however, unavoidable logistical challenges resulted in only a small number of personnel completing both surveys. Air transport to and from Afghanistan was frequently delayed or cancelled due to operational incidents, mechanical problems, weather conditions and so forth, which, given the demands of military operations was perhaps inevitable. The extent of this disturbance had not been fully anticipated, particularly for the group departing for Afghanistan and as a consequence, gaining access to personnel as they transitioned to and from deployment was greatly disrupted. Flights arrived and departed at all hours of the day, aircraft were re-routed to carry casualties, aircraft mechanical problems occurred and adverse weather conditions were surprisingly frequent. It was not possible to position the researcher in the air terminal on a permanent basis. An opportunistic sampling schedule was adopted in order to attempt to survey as many personnel as possible as they transited the arrival and departure area. Different personnel completed the survey at Time 1 and Time 2 with a small number of personnel completing both Time 1 and 2 surveys

Analyses

For this study, the Statistics Package for Social Sciences (SPSS) Version 20 for Windows was used for the analyses. The general analysis strategy was adopted and for those who completed pre and post R&R surveys, continuous scores were compared using Wilcoxon

signed rank test and in the unmatched sample, scores were compared using the Mann-Whitney U test. Statistical significance was defined as $p \leq 0.05$ throughout.

The study was approved by the Ministry of Defence Research Ethics Committee (MODREC, No V.6/Gen/10 dated 16 January 2011).

Results

Sample

536 personnel completed surveys; 304 at Time 1 and 232 at Time 2; the sample total included 42 subjects who completed surveys at both assessment points. The Time 1 response rate was 79.4%; 383 surveys were distributed and 79 personnel either refused to participate or returned incomplete or spoiled questionnaires. The number of non-responders was not recorded at Time 2 as flights could not be supervised continuously by the researcher.

Socio-Demographic and Military Characteristics

The socio-demographic and military characteristics of the R&R sample respondents were compared with population data derived from the whole of the UK AF where this was available (Table 4). Certain groups were over-represented in the R&R sample including Army personnel, junior ranks and individual augmentees. The latter are known as 'IA's' who deploy without the majority of their usual unit. IAs comprised 40.2% (n=206) of the R&R sample compared with a rate of 35.0% which was found among a representative sample participating in a recent survey of deployment mental health. Other groups were under-represented including Royal Air Force personnel, senior ranks, women and reserve forces

personnel. Approximately two thirds of the study subjects were in a longer-term relationship and approximately one third had one or more dependant children. R&R personnel were marginally younger than the UK AF population. Official statistics report the median age of the UK AF as 29 years; the median age of the study sample was 27 years (Defence Statistics, 2013). The Time 1 and 2 samples were compared and only differed significantly in Service background proportions where Army personnel were present in greater numbers in the Time 2 sample.

Table 4. R&R Participants - Socio-demographic Factors

Factor n (%)**	Time 1 n (%)	Time 2 n (%)	χ^2 ,d.f., *p*=	*Armed Forces %
Service Background (n=524)				
Royal Navy 24, (4.6)	18 (5.9)	6(2.7)		20
Royal Marines 68 (13.0)	54 (17.8)	14 (6.4)	**χ^2 =19.02, d.f. 3,**	
Army 393 (75.0)	212 (69.7)	181 (82.3)	***p*<0.01**	52.5
Royal Air Force 39 (7.4)	20 (6.6)	19 (8.6)		22.5
Rank Range (n=524)				
Junior Rank/Junior Non-Commissioned Officer (NCO) 361 (68.9)	212 (69.7)	149 (67.7)		60.7
Senior NCO/Warrant Officer 83 (15.8)	46 (15.1)	37 (16.8)	χ^2 =0.31, d.f. 2,	22.7
Commissioned Officer 80 (15.3)	46 (15.1)	34 (15.5)	*p*=0.86	16.7
Gender (n=514)				
Male 484 (94.2)	279 (93.3)	205 (95.3)	χ^2 =0.95, d.f 1.,	90.4
Female 30 (5.8)	20 (6.7)	10 (4.7)	*p*=0.33	9.6
Relationship Status (n=535)				
Not in a Relationship (single/divorced/separated) 168 (31.4)	95 (31.3)	73 (31.6)	χ^2 =0.01, d.f 1.,	
In a Long Term Relationship 367 (68.6)	209 (68.8)	158 (68.4)	*p*=0.93	
children (n=514)				
No Dependant children 324 (63.0)	184 (62.6)	140 (63.6)	χ^2 =0.60, d.f 1.,	
One or more Dependant children (<18yrs old) 190 (37.0)	110 (37.4)	80 (36.4)	*p*=0.81	
Age Range (n=520)				
18-24 Years 185 (35.6)	110 (36.5)	75 (34.2)		
25-34 Years 243 (46.7)	145 (48.2)	98 (44.7)	χ^2 =3.99, d.f. 3,	
35-44 Years 74 (14.2)	39 (13)	35 (16.0)	*p*=0.26	
45 Plus Years 18 (3.5)	7 (2.3)	11 (5.0)		
Service Length(n=523)				
1-4 Years 202 (38.6)	116 (38.3)	86 (39.1)	χ^2 =0.35, d.f 1.,	
5 Years or More 321 (61.4)	187 (61.7)	134 (61.9)	*p*=0.85	
Engagement Type (n=509)				
Regular 473 (92.9)	277 (92.6)	196 (93.3)	χ^2 =0.90, d.f 1.,	83.6
Reserve 36 (7.1)	22 (7.4)	14 (6.7)	*p*=0.77	16.4
Individual Augmentee or Formed Unit Member (n=512)				
Formed Unit Member 306 (59.8)	181 (60.5)	125 (58.7)	χ^2 =0.18, d.f 1.,	
Individual Augmentee 206 (40.2)	118 (39.5)	88 (41.3)	*p*=0.67	

* www.dasa.mod.uk

** Some sub-category %s do not add up to 100% due to rounding and missing data

Operational Characteristics

Over three quarters (87.7%, n=462) of personnel had deployed previously (range 0 to 9 deployments, mode =1 deployment) and two thirds (65.8% n=345) had accumulated sufficient time currently deployed to theoretically accumulate greater levels of operational exposure, having completed more than 16 weeks in the operational area at the time of R&R; the usual tour length is 26 weeks. Time spent on the current deployment was not significantly different between the two samples. Time 2 respondents had however, over a period of around three years, spent a significantly longer cumulative period deployed than Time 1 subjects (51.6% vs. 21.1%, $p<0.001$), though most personnel (91.4% n=467) had accumulated deployments totalling less than 13 months in the last thirty months. Therefore, Harmony Guidelines had been breached for less than one tenth of personnel and there were no significant differences in the proportions experiencing such breaches between the two samples. During the current deployment, the majority of personnel had spent their time working in relatively well protected locations, with the remainder (41.9%, n=219) deployed to more austere and dangerous exposed locations; there were no significant differences in the potential dangerousness of deployed locations between the two samples. Over two thirds of respondents (70.3%, n=367) reported experiencing perceptions of impending death or serious injury at least once during the current deployment; Time 2 respondents were significantly more likely to report this outcome than Time 1 subjects (83.7% vs. 60.0%, $p<0.001$). The detailed operational characteristics are shown in Table 5.

Table 5. R&R Participants - Operational Factors

*Operational Factors n (%)	Time 1 n (%)	Time 2 n (%)	χ2 ,d.f., *p*=
Previous Deployments (n=527)	**n=299**	**n=228**	χ^2 =0.25, d.f. 1,
0 65 (12.3)	35 (11.7)	30 (13.2)	*p*=0.62
1 Plus 462 (87.7)	264 (88.3)	198 (86.8)	
Current Deployment Duration (n=524)	**n=299**	**n=225**	**χ^2 =53.05, d.f. 1,**
0-16 Weeks 345 (65.8)	236 (78.9)	109 (48.4)	***p*<0.001**
16 Weeks or More 179 (34.2)	63 (21.1)	116 (51.6)	
Harmony Guidelines (n=511)	**n=291**	**n=220**	χ^2 =0.38, d.f. 1,
Deployed Within Harmony (<1 year Deployed in Three) 467 (91.4)	264 (90.7)	203 (92.3)	*p*=0.54
Harmony Breach (>1 Year Deployed in Three) 44 (8.6)	27 (9.3)	17 (7.7)	
Operational Area Location (n=523)	**n=300**	**n=223**	χ^2 =0.12, d.f. 1,
Mostly Check Points and Patrol Bases 219 (41.9)	125 (41.7)	94 (42.2)	*p*=0.91
Mostly Forward or Main Operating Bases 304 (58.1)	175 (58.3)	129 (57.8)	
Potentially Traumatic Exposure (Fear of Death or Injury) (n=522)	**n=295**	**n=106**	**χ^2 =34.52, d.f. 1,**
Never 155 (29.7)	118 (40.0)	37 (16.3)	***p*<0.001**
One or more Times 367 (70.3)	177 (60.0)	190 (83.7)	
Combat Exposure Tertiles (n=425)	**n=302**	**n=123**	**χ^2 =7.05, d.f. 1,**
Lower and Middle 292 (68.7)	219 (72.5)	73 (59.3)	***p*<0.01**
Upper 133 (31.3)	83 (27.5)	50 (40.7)	

** Some sub-category %s do not add up to 100% due to rounding and missing data

The most frequent operational or combat exposure factor reported on the combat experiences scale was being subjected to incoming artillery, rocket or mortar fire with 53.6% of personnel (n=225) reporting events of this kind, 49.3% (n=207) experienced enemy small arms (rifle) fire and 34.0% (n=142) encountered hostile or aggressive reactions when interacting with Afghan civilians (Table 6).

Table 6. R&R Participants - Operational Factors – Exposure to Combat and Operational Events

Have you experienced any of the following during THIS DEPLOYMENT? (n)	One or More Times n (%)
Received incoming artillery, rocket, or mortar fire (n=420)	225 (53.6)
Received small arms fire (n=420)	207 (49.3)
Encountered hostile or aggressive reactions from civilians (n=418)	142 (34.0)
Seen dead or seriously injured friendly forces personnel (n=415)	133 (32.0)
Cleared/searched homes or buildings, caves or bunkers (n=415)	110 (26.5)
Had an improvised explosive device (IED) or booby trap explode near you (n=420)	102 (24.3)
Shot at the enemy with your personal weapon (n=415)	91 (21.9)
Provided aid to the wounded (n=419)	90 (21.5)
Encountered enemy sniper fire (n=418)	82 (19.6)
Seen injured or sick women or children who you were unable to help (n=414)	75 (18.1)
Been threatened and were unable to respond because of the rules of engagement (n=415)	72 (17.3)
Had a mate injured or killed who was near you (n=416)	60 (14.4)
Handled or discovered human remains (n=415)	48 (11.6)
Had a close call where a shell, rocket or missile that failed to explode landed near you (n=417)	28 (6.7)
Had equipment shot off your body or you were shot or hit but protective gear saved you (n=415)	5 (1.2)
Been wounded or injured (n=416)	6 (1.4)
Engaged in close quarter battle with fixed bayonet (n=416)	6 (1.4)

R&R Experiences

95.7% (n=179 of 187) of respondents reported general satisfaction with R&R, 95.5% would value R&R on a subsequent deployment, 92.5% rated it as a positive experience, 92.1% were able to do what they wanted to during R&R and 91.8% had their individual needs met (Table 7).

Table 7. General Satisfaction Items from the R&R Experiences Scale

R&R Experiences Survey Satisfaction Items	Yes n (%)	No n (%)
If you were deployed again, would you like R&R on that deployment?	182 (95.5)	9 (4.5)
Overall, I was satisfied with the experience of R&R	179 (95.7)	8 (4.3)
I did what I wanted to do on R&R	175 (92.1)	15 97.9)
The experience of R&R was positive	172 (92.5)	14 (7.5)
R&R met my needs	169 (91.8)	15 (8.2)

The study respondents rated 25 further factors relating to the individual elements of R&R. (Table 8).

Table 8. R&R Experiences Scale - Individual Item Responses

R&R Experiences Survey Items	Yes	No
I saw family/friends	221 (99.5)	1 (0.5)
I got a break from the physical demands of being on tour	214 (98.4)	3 (1.4)
I could do relaxing things	209 (98.6)	3 (1.4)
I could do leisure activities that I enjoy	206 (97.6)	5 (2.4)
I felt close to my family/friends on R&R	195 (95.6)	9 (4.4)
I got as much support as I wanted from my family/friends	199 (93.4)	15 (6.6)
I could chill out	190 (92.7)	15 (7.3)
I could relax and switch off from feeling in danger	191 (91.8)	17 (8.2)
I was able to get a good night's sleep	181 (86.2)	29 (13.8)
I have recovered physically	162 (85.3)	28 (14.7)
I felt recharged and had more energy by the end of R&R	147 (73.5)	53 (26.5)
Overall, I was satisfied with the experience of travelling back to the UK	120 (69.4)	53 (30.6)
I talked about what I have been doing on tour with my family/friends as much as I wanted	126 (64.0)	71 (36.0)
My experience of the journey back to the UK was positive	102 (63.8)	58 (36.3)
The journey back to the UK did not adversely affect my experience of R&R	112 (59.3)	77 (40.7)
I did not find the journey back to the UK frustrating	120 (57.3)	89 (42.6)
I felt rested by the end of R&R	114 (55.3)	92 (44.7)
I did not lose too many of my R&R days as a result of being delayed on the journey back	108 (55.1)	88 (44.9)
On R&R I felt close to the people that matter to me	112 (54.4)	94 (45.6)
It was not difficult to kick back and do nothing at home	110 (53.9)	94 (46.1)
I did not worry about work or my unit back in Afghanistan	107 (52.2)	98 (47.8)
I forgot about work	105 (50.7)	102 (49.3)
I could switch off and did not think about what was happening in Afghanistan	98 (48.3)	105 (51.7)
I did not try to get news about what was happening back in Afghanistan	87 (42.2)	119 (57.8)
I did not think about work at all	72 (34.4)	137 (65.6)

When the elements were rank ordered according to the rate of endorsement of each item, the five most frequently endorsed items related to being with friends and family and having the opportunity to take a break and relax. These were endorsed by over 95.0% of personnel. The five least frequently endorsed items related to being able to cognitively disengage from Afghanistan. Substantial numbers of personnel reported that they worried about, thought about or tried to get news of their colleagues back in Afghanistan during R&R and continued to think about their work while they were at home.

Comparisons were made between those expressing overall satisfaction or dissatisfaction with R&R using a range of socio-demographic, military and operational characteristics as independent variables. For most of the characteristics that were evaluated, the levels of satisfaction were not significantly different between sub-categories. However, significant differences were found for length of time spent in the operational area prior to R&R, where 89.4% of those deployed for 16 weeks or less (n=93) were significantly more likely to be satisfied with R&R compared to 75.5% of those who had spent a longer period in the operational area (n=74) ($p<0.01$). Of those personnel who were in a long term relationship, 85.9% (n=122) reported satisfaction compared to 72.3% of those who were not in a long-term relationship (n=47) ($p=0.02$). 86.8% of personnel who reported more frequent perceptions of impending death or serious injury (n=151) were satisfied with their overall experience of R&R compared to 58.6% of those with fewer such perceptions (n=17) ($p<0.001$). Satisfaction rates were lower at 64.3% among those reporting functional impairment during R&R (n=18) than the rate of 84.8% among those experiencing no such impairment (n=134) ($p=0.01$). The satisfaction analyses are shown in Table 9.

Table 9. Overall Satisfaction with R&R – Significant Differences among Socio-Demographic, Operational and Functional Impairment Categories

Overall Satisfaction with R&R			
Factor n (%)	***Dissatisfied n (%)**	****Satisfied n (%)**	**χ^2 ,d.f., *p*=**
Time Deployed(n=202)			
0-15 weeks 104 (51.5)	11 (10.6)	93 (89.4)	**χ^2 =6.82 d.f. 1,**
16 weeks or More 98 (48.5)	24 (24.5)	74 (75.5)	***p*<0.01**
Relationship Status (n=207)			
Not in a Relationship (Divorced/Single/Separated) 65 (31.4)	18 (27.7)	47 (72.3)	**χ^2 =6.10 d.f. 1,**
In a Relationship/Married 142 (68.6)	20 (14.1)	122 (85.9)	***p*=0.02**
Perceptions of Death and Impending Physical Injury (n=203)			
Never Experienced 29 (14.3)	12 (41.4)	17 (58.6)	**χ^2 =14.58 d.f. 1,**
Experienced One or More Times 174 (85.7)	23 (13.2)	151 (86.8)	***p*<0.001**
Functional Impairment (n=186)			
No Impairment 158 (85.0)	24 (15.2)	134 (84.8)	**χ^2 = 6.71 d.f. 1,**
Some Level of Impairment 28 (15.1)	10 (35.7)	18 (64.3)	***p*=0.01**

* 0-3 Satisfaction Items Endorsed
** 4-5 Satisfaction Items Endorsed

Combat exposure, time in the operational area and functional impairment appeared to cluster; 38.3% (n=57) of those personnel who had spent 16 or more weeks in the operational area reported greater levels of combat exposure compared to 27.2% (n=73) of those who had deployed for 15 weeks or less (χ^2 =5.42, d.f. 1, *p*=0.02). Those spending longer currently deployed were also significantly more likely to report functional impairment arising from mental health symptoms (16 or more weeks deployed, 19.3% (n=31) vs. 15 weeks or less 11.6% (n=37 χ^2 =5.09, d.f. 1, *p*=0.02).

Mental Health Outcomes

Probable CMD caseness levels were found among 11.6% (n=60) of respondents overall and probable PTSD caseness was detected among 3.2% (n=16) of all respondents. 46.9% (n=135) of Time 1 respondents were found to endorse levels of alcohol consumption representative of hazardous use in the year prior to deployment and 50.0% reported this level

of use during R&R (n=110); the difference between the usual level of alcohol use and the level of alcohol use during R&R was not statistically significant. 14.0% (n=68) of all respondents reported moderate to severe functional impairment related to the presence mental health symptoms. 92.3% (n=480) of personnel reported high levels of subjectively good health. Overall, there were no statistically significant differences in the rates of mental disorder, functional impairment or ratings of global health between the Time 1 and 2 samples. Table 10 shows the analyses of mental health outcomes.

Table 10. R&R Study - Mental Health Outcomes

Mental Health Outcome n (%)	**Time 1 n (%)**	**Time 2 n (%)**	**$\chi 2$,d.f., p=**
PTSD (n=508)	**n=291**	**n=217**	χ^2 =0.36, d.f. 1, p=0.55
Probable caseness (PCL-C Score ≥50) 16 (3.2)	8 (2.7)	8 (3.7)	
***Alcohol (n=508)**	**n=288**	**n=220**	χ^2 =0.49, d.f. 1. p=0.49
Hazardous use (AUDIT 8 cut off)	135 (46.9)	110 (50.0)	
Common Mental Disorder (n=520)	**n=297**	**n=223**	χ^2 =0.12, d.f. 1, p=0.72
Probable caseness (GHQ 12 ≥4 symptoms) 60 (11.6)	33 (11.1)	27 (12.1)	
Functional impairment (n=487)	**n=281**	**n=206**	χ^2 =1.26, d.f. 1, p=0.26
None or little impairment 419 (86.0)	246 (87.5)	173 (84.0)	
Greater impairment 68 (14.0)	35 (12.5)	33 (16.0)	
Global Health Rating (n=520)	**n=300**	**n=220**	χ^2 =0.48 d.f. 1, p=0.49
Poor or fair health 40 (7.7)	21 (7.0)	19 (8.6)	
Good, very good or excellent health 480 (92.3)	279 (93.0)	201 (91.4)	

*Overall levels of hazardous alcohol use are not shown as different sample periods were used for Time1 and Time 2 respondents

CMD and PTSD cases were amalgamated to represent any case of mental health disorder to examine whether there were any overall mental health differences between the two samples; there were none; (Time 1 CMD and PTSD =12.0%, (n=36), Time 2 CMD and PTSD =13.5% (n=30), OR 1.14, 95% CI 0.68-1.91). Binary logistic regression analyses were repeated adjusting for a range of potential confounders, including: engagement type, IA status, Service, rank, sex, age, dependant children, previous tours, cumulative deployment time,

combat arm, perceptions of impending death or serious injury, global health, PTSD, hazardous alcohol use and CMD; no potential confounders had a statistically significant adjusting effect. Binary logistic regression analyses were repeated using hazardous drinking as the dependant variable and time of sampling as the independent variable; no significant differences were demonstrated between the two samples (OR 1.13, 95% CI 0.80-1.61). After adjusting for the confounding variables described above (excluding hazardous alcohol use) there were no significant adjusting effects except for the finding that hazardous alcohol use was significantly more common among those exposed to higher levels of combat (OR 1.89, 95% CI 1.20-2.97).

R&R Experiences Scale Components

The first R&R component generated from the PCA, explaining 28.8% of the total model variance, was labelled 'mental disengagement from events in Afghanistan'. The second component, explaining 12.0% of the model variance, was labelled 'rest and social support'. The remaining components were labelled 'travel', 'physical recovery' and 'relaxation', explaining 8.7, 6.3 and 5.4% of the total model variance respectively. With the exception of the relaxation component, for subjects with scores falling within the upper percentile of scores representing higher levels of mental disengagement from Afghanistan, more positive ratings of travel, physical recovery and greater endorsement of the ability to rest and engage with social support, there was a significantly reduced odds of reporting hazardous alcohol use during R&R. Following adjustment for a range of confounding variables the association of hazardous alcohol use and the physical recovery and rest and social support components was no longer significant. With exception of the travel component, scores falling within the upper percentile of disengagement, physical recovery, relaxation, rest and social support, there was a significantly reduced odds of reporting either CMD or PTSD symptoms. Following

adjustment for confounders, the association between mental health symptoms and the physical recovery component became non-significant. The detail of the five selected components and their association with mental health and alcohol outcomes is shown in Table 11.

The differences in mean PCL-C, GHQ-12 and AUDIT scores pre and post R&R in the matched sample were not statistically significantly different. In the non-matched samples, the mean score for the PCL-C was significantly higher at Time 2 (22 at Time 1 and 23 at Time 2 (possible range 17 to 85), U = 19477.0, $p<0.05$). For the mean GHQ-12 and AUDIT scores, there were no significant differences.

Table 11. R&R Components and their Relationship to Mental Health and Alcohol Use

Table 5 R&R Components	Percentile (n)	AUDIT ≥8 n (%)	n	OR (95%CI)	[1]AOR (95%CI)	*Mental Health n (%)	n	[1]OR (95%CI)	AOR (95%CI)
Disengagement from Events in Afghanistan Component I did not think about work at all I could switch off and did not think about what was happening in Afghanistan I did not worry about work or my unit back in Afghanistan I forgot about work I did not try to get news about what was happening back in Afghanistan	1	43 (62.3)	69	1	1	15 (21.4)	70	1	1
	2	17 (43.6)	39	0.47 (0.21-1.04)	0.40 (0.15-1.04)	10 (25.6)	39	1.26 (0.51-3.17)	1.53 (0.52-4.47)
	3	24 (57.1)	42	0.81 (0.37-1.76)	0.78 (0.30-2.06)	3 (7.1)	42	0.28 (0.08-1.04)	0.25 (0.05-1.30)
	4	22 (34.4)	64	**0.32 (0.16-0.64)**	**0.37 (0.14-0.93)**	1 (1.5)	66	**0.06 (0.01-0.44)**	**0.60 (0.01-0.54)**
Travel Component How would you rate your experience of the journey back to the UK? Overall, how satisfied are you with your experience of travelling back to the UK?	1	28 (62.2)	45	1	1	10 (21.7)	46	1	1
	2	15 (50.0)	30	0.61 (0.37-1.76)	0.37 (0.11-1.29)	5 (16.1)	31	0.69 (0.21-2.27)	1.17 (0.27-5.11)
	3	33 (36.3)	91	**0.35 (0.17-0.72)**	**0.30 (0.11-0.80)**	9 (79.8)	92	0.39 (0.15-1.04)	0.45 (0.13-1.56)
Physical Recovery Component The journey back to the UK had a negative impact on my experience of R&R I did not feel close to my family/friends on R&R It was difficult to kick back and do nothing at home	1	26 (76.5)	34	1	1	10 (28.6)	35	1	1
	2	44 (43.6)	101	**0.24 (0.10-0.58)**	0.40 (0.14-1.10)	12 (11.9)	101	**0.34 (0.13-0.87)**	0.37 (0.12-1.14)
	4	35 (44.9)	78	**0.25 (0.10-0.62)**	0.61 (0.20-1.81)	7 (8.8)	80	**0.24 (0.08-0.70)**	0.33 (0.09-1.20)
Relaxation Component I could relax and switch off from feeling in danger I got a break from the physical demands of being on tour I saw family/friends I got as much support as I wanted from my family/friends	1	36 (60.0)	60	1	1	16 (26.2)	61	1	1
	3	71 (45.5)	156	0.56 (0.30-1.02)	0.77 (0.37-1.61)	13 (8.2)	158	**0.25 (0.11-0.56)**	**0.23 (0.09-0.60)**
Rest and Social Support I could do leisure activities that I enjoy I got as much support as I wanted from my family/friends I could chill out On R&R I felt close to the people that matter to me I was able to get a good night's sleep	1	47 (60.3)	78	1	1	21 (26.6)	79	1	1
	3	60 (43.8)	137	**0.51 (0.29-0.91)**	0.75 (0.37-1.50)	8 (5.8)	139	**0.17 (0.07-0.40)**	**0.12 (0.04-0.37)**

* Composite variable consisting of PCL-C score ≥44 and /or GHQ12 score ≥4

[1] Adjusted for Regular or Reserve Status, Individual Augmentee Status, Service background, Rank, Sex, Age, Dependant Children, Previous Operational Deployment, Concerns About Death or Injury, Relationship Status, Combat Arm and Time Deployed on the Current Tour

Main Findings

The main findings of this study were that taking R&R was a highly satisfying experience for over 90% of the respondents and the vast majority would like to take a period of R&R during future deployments. The most highly endorsed aspects of R&R related to being with friends and family and having the opportunity to use the pause in operational deployment to relax. Over half of the military personnel taking part in this study appeared to have difficulty cognitively disconnecting from events in Afghanistan during their spell of R&R. This was evidenced by personnel reporting that they worried about friends and colleagues in Afghanistan and tried to get news about their deployed unit during R&R. This is important as disengagement from events in Afghanistan was linked to better mental health and lower levels of hazardous alcohol use. As described in the introductory chapter, the hypothesis tested was that symptoms of common mental disorder (CMD) and posttraumatic stress disorder (PTSD) would be similar among military personnel about to embark upon a period of R&R to those reported by personnel as they finished their time at home and left to journey back to the operational area. In this case, the null hypothesis was supported in that there was no evidence that taking R&R had any substantial effects upon overall mental health when personnel departed back to the operational area and when potential confounders were accounted for, physical recovery did not appear to be associated with engagement with the R&R process. Levels of symptoms of both mental disorder and alcohol use were similar among both the unmatched pre and post R&R samples and although PTSD scores were statistically significantly different at both measurement points within the matched sample, mean scores differed by very small margins and were not therefore clinically meaningful. The secondary objective of this study was to describe any factors which were significantly associated with increased mental health symptoms and alcohol misuse. Although

no factors proved to be significant predictors, the ability to utilise R&R for the purpose for which it was intended, that is, to rest at home, seemed to be an important associate of mental health; this was evidenced by better levels of mental health among those who engaged with various aspects of the R&R process.

CHAPTER 5 – PRIMARY PREVENTION - THE PSYCHOLOGICAL IMPACT OF THIRD LOCATION DECOMPRESSION (TLD)

Overview

Third Location Decompression (TLD) is a structured activity undertaken by UK Armed Forces personnel at the end of an operational deployment. TLD aims to smooth the transition between operations and returning home and to promote better re-adjustment and mental health in the period immediately following deployment. This thesis component assessed whether undertaking TLD had any impact upon mental health and post-deployment re-adjustment. Data collected during a large military cohort study was examined to identify personnel who either engaged in TLD following deployment before they returned home or went directly back to their home base with no additional transition activity. As these data were observational, propensity scores (PS) were generated to pseudo-randomise the data and the PS were used to calculate inverse probability of treatment weights which were applied to the dataset before conducting adjusted regression analyses. A range of mental health outcomes and post-deployment re-adjustment problems were compared among those who did and did not transition through TLD at the end of their operational tour. The results of the study suggested that TLD had a positive impact upon two out of five assessed mental health outcomes; these were PTSD and multiple physical symptoms. In addition, TLD attendance appeared to be associated with reduced levels of harmful alcohol use. A small number of indicators of post-deployment readjustment were examined which were characterised by experiencing homecoming problems, difficulty readjusting to being at home and difficulty resuming normal social activities. There was no evidence to suggest that TLD promoted better transition from operations to the peacetime

environment. However, when the samples were stratified by the level of combat exposure experienced during deployment, although post deployment re-adjustment was similar for all exposure levels, personnel experiencing low and moderate levels of combat exposure experienced the greatest positive mental health benefits following participation in TLD.

Introduction

Within the United Kingdom Armed Forces, Third Location Decompression (TLD) is a post deployment activity which provides for a pause at the end of an operational deployment. TLD does not have an underlying theoretical basis and is largely about structured, supervised rest. Despite this, among military commanders it is widely promoted as a positive mental health strategy and its distinctive features are broadly representative of a primary preventative mental health intervention. Given that TLD has been widely used within the UK AF following combat operations for a number of years without any evaluation of its effect upon mental health, this study aimed to assess whether it had any significant psychological effects and whether it assisted in promoting better post-deployment readjustment. The study null hypothesis was that there would be no difference in mental health symptom levels and post-deployment readjustment among those who did and did not attend TLD.

Study-Specific Methods

Study Design and Participants

This study used data collected during a UK-based longitudinal cohort study of military personnel conducted by the King's Centre for Military Health (KCMHR) using a self-report survey instrument (Hotopf et al., 2003). Phase 1 of the cohort study assessed the health of a randomly selected group of UK AF personnel (approximately 10%) who were deployed to the warfighting phase of operations in Iraq in 2003 (codenamed Operation TELIC) and a randomly selected group of personnel who were serving in the UK AF at the time of the war but who did not deploy to the Persian Gulf. To transform the cohort to yield longitudinal data, a second phase of data collection took place approximately four years after the initial survey. To ensure that the survey sample remained contemporary and took account of rapidly expanding operations in Afghanistan, two supplementary samples of personnel were recruited into the cohort (Fear et al., 2010). The final sample consisted of the original 9,395 individuals who had participated at phase 1 and provided data at phase 2; 1,789 randomly selected personnel who had deployed to military operations in Afghanistan (codenamed Operation HERRICK) between April 2006 and April 2007; to maintain the characteristics of the original cohort, a replenishment sample of 6,628 randomly selected individuals who had joined the UK AF since 2003, making a total of 17,812 subjects. Data collection for phase 2 began in November 2007 and ended in September 2009. A total of 9,990 participants responded to the survey at phase 2 giving a final response rate of 56%. Responding to the request to complete the survey was associated with older age, being female, officer status and being a member of the Regular as opposed to Reserve Forces. Crucially, non-response at phase 2 was not associated with mental health status at phase 1,

including probable Post Traumatic Stress Disorder (PTSD), common mental disorder (CMD) or alcohol misuse. Weights were created to account for sampling fractions and to account for response rate differences at phase 2. The study received ethics approval from the MoD's research ethics committee (MODREC) and King's College Hospital local research ethics committee.

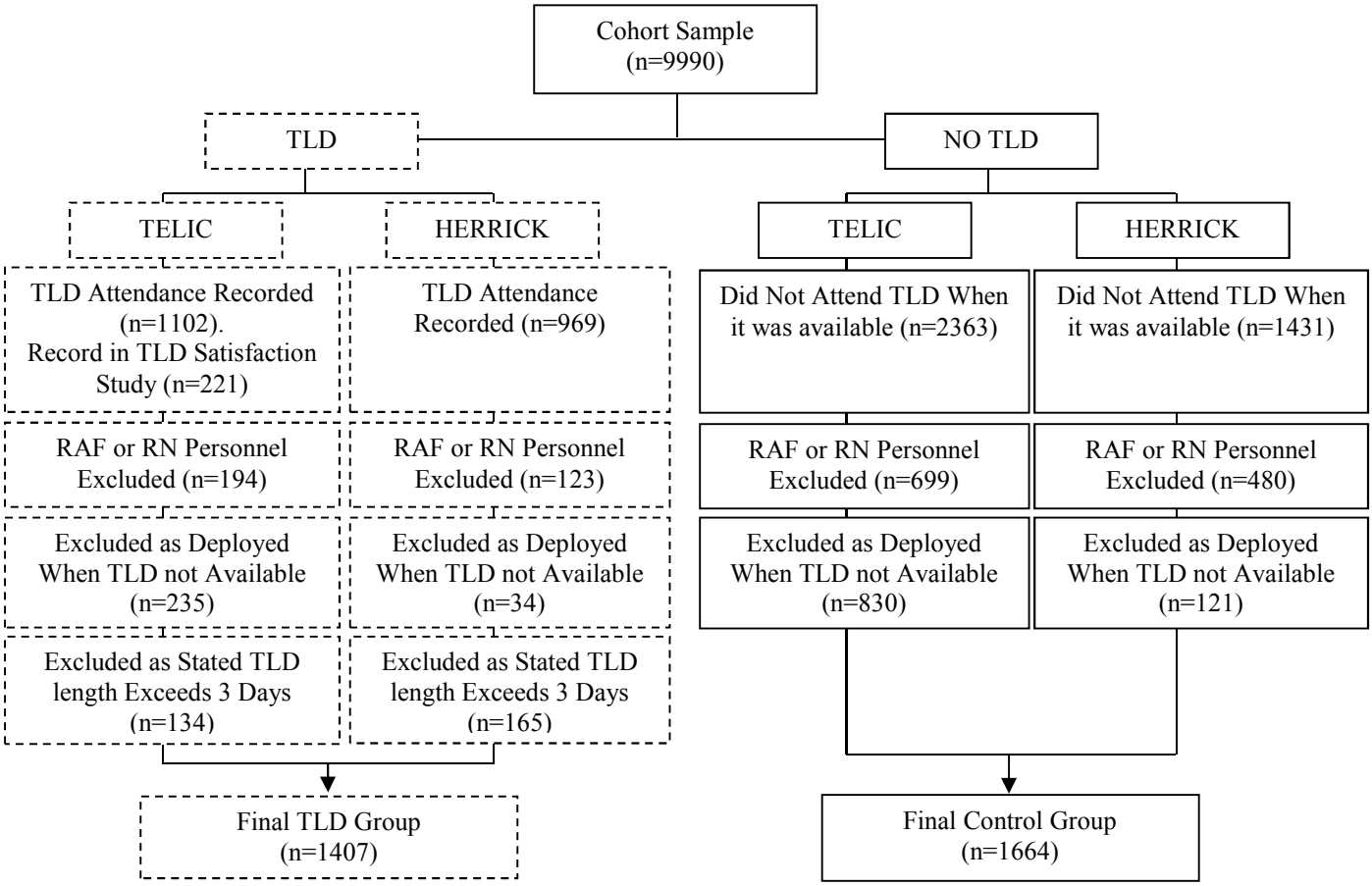
Sample

For the purpose of the TLD study, subjects were recruited from the cohort into the TLD attendance sample if they answered the following study question; 'after leaving deployment following the most recent [Afghanistan or Iraq] deployment, did you have a short period of time away from the operational area for you to relax before returning to your home base?' Personnel were excluded if they did not answer the question. Some subjects may have been reporting alternative forms of transition support such as operational stand down, where rest is taken close to the operational area, not in a third location. To ensure that this did not occur, survey respondents were excluded from the TLD study if the date of the rest period coincided with a period when it was known that TLD had not taken place. Respondents were further excluded if the date of attendance at TLD was not recorded or the stated length of the rest period exceeded three days. TLD seldom exceeds two days in duration and never exceeds a period of three days including travel to and from the TLD location. Some participants who provided data for the KCMHR cohort study also took part in a separate study which assessed the subjective utility of TLD. Mental health and readjustment information provided by personnel who failed to answer the cohort survey question concerning post deployment rest were included in the TLD sample if

they had a valid record of attendance in the TLD utility study. Although TLD is now mandatory for all deploying personnel, this has not always been so. During the early phase of implementation, TLD was undertaken at the discretion of the operational commander and TLD policy was less rigorously applied. To construct the control sample, subjects were recruited if they stated that they had not undertaken TLD when it was available but had undertaken an operational deployment to either Iraq or Afghanistan. Personnel were excluded from the control sample if their deployment took place when TLD was not available.

Most of the Royal Navy (with the exception of Royal Marines) and Royal Air Force personnel who attended TLD prior to Phase 2 of the cohort study were Individual Augmentees ('IAs' or personnel who deploy as individuals without the majority of their parent unit). Most of these personnel volunteered to take part in TLD or had to attend because they were attached to a formed unit to provide a specialist function during the deployment. As described earlier, their attendance as IAs was only mandated from early 2011. These personnel therefore constituted a substantial number of the survey controls (n=1130) but a smaller number of TLD attendees (n=317). RAF and RN units deploy and engage with TLD in a Service-specific way compared to ground units and, overall, they face fewer operational threats than Army and Royal Marine personnel. In order to harmonise the comparison groups, RN and RAF personnel were excluded a priori. Royal Marines, who deployed mostly in a ground role during the study period, were included in both the TLD attendee and control groups. The process for generating the TLD sample and the number of subjects excluded is shown in Figure 4.

Figure 4. The Process of Generating the TLD Study Sample



Mental Health Measures

Self-rated general health, CMD, probable PTSD were assessed using the standard cut-off scores and measures described in the general methodology section of this thesis. Alcohol use was measured using the 10 item AUDIT where scores ≥16 indicated alcohol use that is potentially harmful to health.

Readjustment Measures

Post-deployment re-adjustment was assessed using four questions extracted from an eleven item post-deployment experiences scale. Following pilot study interviews, the scale was generated for the deployment element of the KCMHR cohort survey with additional advice from a sociologist about the utility of each item. Four of the scale items asked about post deployment re-adjustment rather than the general experience of returning home and these were used in the current study. The four questions were; 'I had no major problems on return from deployment' (this item was reverse scored); 'I found it difficult to adjust to being back home'; 'I found it difficult to resume my normal social activities' and 'I had other major problems on return from deployment'. Each question was answered using a dichotomous response indicating agreement or disagreement. A positive response to any of the questions was taken to mean that a re-adjustment problem had occurred. The scale was summated and a binary variable was generated reflecting whether re-adjustment was present, as indicated by one or more endorsements, or absent, represented by no endorsements.

Leadership and Combat Exposure

Leadership and combat exposure were assessed using the scales described in the general methods chapter. For leadership, a binary variable was generated where the endorsement of three or more of the leader behaviours represented high levels of leadership and two or fewer indicated lower levels. Leadership was used as a covariate in the generation of propensity scores. For the combat and operational exposure scale, tertiles were generated from summated scores for the whole scale. The study groups were then stratified by level of combat exposure with high levels

of exposure represented by scores falling above the upper tertile, moderate exposure by scores situated between the middle and lower tertile and the lowest exposure levels by scores falling below the lower tertile.

Propensity Scores

Random assignment to receive or not to receive an intervention is normally used in robust outcome studies in an attempt to ensure that receipt or non-receipt of the intervention is the only differentiating factor between two study groups. In this way, a control group can be used to evaluate the effects of non-intervention. The general principle of propensity score matching is that when randomisation is absent, as is the case with observational data, propensity score matching can be used to identify subjects who received an intervention who have similar, but not necessarily identical characteristics to those who did not receive the intervention. The propensity score therefore represents the probability that a subject in the combined sample of intervention and non-intervention subjects receives the intervention, based upon a set of observed variables. The differential effects of intervention between two matched subjects can then be estimated and when this effect is averaged across the whole study sample, the overall effect of the intervention can be estimated. As the subjects in this study were not randomised to receive TLD and the delineating independent variable was receipt of the TLD intervention, propensity scores were thought to be appropriate and were used to minimise bias. In this study, the propensity score (PS) summarised the probability of receiving TLD as a decimal which was calculated using an algorithm. Socio-demographic, military and operational characteristics with a theoretical link to attendance or non-attendance at TLD were entered into the calculation. Theoretically, many

participants with the same propensity score are likely to appear in both the TLD attendance and non-attendance samples, therefore the samples should be approximately balanced on the variables predicting the propensity score. However, the successful calculation of propensity scores relies upon having a full dataset with very little missing data and that data be gathered from the same source using a similar instrument (Heinrich et al., 2010). If any of the observed covariate fields within the dataset contain even relatively small quantities of missing data, the calculation will fail. The KCMHR dataset was sufficiently complete for the purpose of generating propensity scores.

Covariates selected for inclusion in the calculation of the PS were those that hypothetically could have been sources of potential bias and included:

Combat role, which has three sub-categories. These are: combat arm personnel, who engage the enemy; combat support arm personnel, who provide direct support for combat personnel and combat service support arm personnel, who provide logistic, medical and general support. This variable was used in the calculation of the PS as those with potentially greater exposure to the rigours of combat might be directed to attend TLD by their commanders to alleviate the effects of combat fatigue.

The remaining variables used were:

1. Younger (≤24 years) versus older age (≥25 years); younger personnel were likely to be of lower rank and possibly less able to exercise choice in attending TLD.

2. Engagement type; reserve forces personnel were less likely than regular forces personnel to be found in formed units and were less likely to be required to attend TLD at the time that data were collected for this study.

3. IA or formed unit deployment; at the time of data collection personnel in the IA category were less likely to attend TLD.

4. Being in a long-term relationship or not; personnel who are in a long term relationship are theoretically more likely to attempt to bypass TLD to return to their loved ones as early as possible.

5. Leadership levels; theoretically, good leaders are more likely to seek to ensure that personnel under their command attend TLD as they are concerned for their subordinates welfare.

6. Time since deployment; operational deployments are broken up into six month segments or phases which are sequentially numbered. The end dates of the various operational phases were known to the researcher and the operational phase within which each subject deployed was also known. Military units return from deployment at various times over a six week period at the end of each deployment phase and it was difficult to be precise about the exact date of attendance at TLD or the date of return home. To account for a potential delay in returning home, which can happen for some, particularly for personnel

with a logistics role, attendance at TLD or the return home was estimated to have occurred within a three month period following the end of each of the operational phases.

As sample sizes increase, the PS captures incrementally greater amounts of the variation in the covariates related to receiving the intervention (Rosenbaum and Rubin, 1983) and has a higher likelihood of balancing the distribution of the covariates across intervention and non-intervention samples (Rosenbaum, 2002). Using the 'area of common support' option in the statistical programme, it was possible to check that there were sufficient numbers of individuals who shared similar propensity scores amongst the TLD attendance and non-attendance samples (Caliendo and Kopeinig, 2002). The results of this element of the analysis suggested that the distribution of the observed baseline covariates was sufficiently similar between attendees and non-attendees for the calculation of the PS to proceed (Austin, 2011). Using further equations in the statistical package, following the application of the PS, the balance of the model was checked to ensure that the distribution of the covariates was the similar among the attendance and non-attendance samples. The diagnostic tests generated six strata of subjects with similar propensity scores; with the exception of military rank, each of the selected covariates was balanced across subjects in each of the strata thus indicating a robust model. When imbalances occur, the model is rejected and the covariate causing the imbalance is reported. Imbalances usually occur when covariate fields are insufficiently populated or are substantially skewed; the variable must be deleted before re-evaluating the PS balance in the dataset sub-samples. The general function of the PS is to summarise the chosen covariates which are represented as a single decimal for each subject. In the current study, the rank variable was not included in the final PS calculation as it

was unequally distributed across the two samples and could not be balanced. This variable was therefore adjusted for in the final regression analyses.

PS scores can be used in a variety of ways when comparing samples. In the current study, inverse probability of treatment weights (IPTW) were calculated and applied to the dataset prior to conducting regression analyses. The IPTW was generated by dividing 1 by the propensity score for attendees and 1 divided by 1 minus the propensity score for non-attendees. In theory, when the PS derived IPTWs are applied, a pseudo-randomisation effect is achieved which allows any researcher using longitudinal data to make causal inferences about receiving or not receiving and intervention with greater confidence. A composite weight was generated by multiplying the sample and response weight described earlier by the IPTW.

Analyses were undertaken using the statistical software package Stata version 10.1. As the data were weighted, the analyses presented in this study used the survey (svy) command in Stata. All categorical variables were examined using Pearson's chi Squared Test using Scott and Rao's second order correction to account for weighted data (Rao and Scott, 1984). Outcomes were examined using weighted multivariable logistic regression to generate odds ratios with 95% confidence intervals which were adjusted for rank and the statistical significance of the effect of combat exposure was calculated through Wald's test. Weighted percentages and odds ratios (OR) are presented throughout the results section with un-weighted cell counts.

Results

To assess whether TLD promoted better readjustment and mental health in attendees, differences in post-deployment re-adjustment and longer term mental health were compared with a non-attendance sample. 3071 personnel fulfilled the inclusion criteria for the study; 45.8% (n=1407) were TLD attendees and 54.2% (n=1664) formed the non-intervention (control) group. The TLD group were younger and of lower rank than the control group; 46% (n=790) of the controls were aged 18-30 compared to 55.4% (n=828) of the TLD attendees (p<0.001); there were significantly more combat support arm personnel in the control group; 13.4% (n=208) of the controls were from the combat support arm compared to 8.3% (n=114) of the TLD attendees (p <0.01). In all other respects, the socio-demographic characteristics of the two samples were not significantly different (Table 12).

Table 12. Demographic Characteristics TLD Participants and Controls

Socio-Demographic Factors (n)	****Controls** n (%)	**TLD** n (%)	***p=**
Age at Phase 2 (in years) (2971)			***p*<0.001**
18-20 (120)	31 (2.1)	89 (3.3)	
21-25 (733)	319 (20.9)	414 (23.9)	
26-30 (715)	390 (23.0)	325 (28.2)	
31-35 (545)	339 (21.3)	206 (19.5)	
36-40 (510)	329 (20.6)	181 (18.4)	
41-45 (191)	138 (7.6)	53 (4.8)	
≥46 Years (157)	118 (4.6)	39 (1.9)	
Engagement Type (3071)			*p*=0.6
Regular (2733)	1517 (94.3)	1216 (94.7)	
Reserve (338)	147 (5.7)	191 (5.3)	
Role (2971)			***p*<0.01**
Combat (936)	385 (32.3)	551 (33.8)	
Combat Support Arm (322)	208 (13.4)	114 (8.3)	
Combat Service Support (1713)	1071 (54.4)	642 (57.9)	
Service (3071)			*p*=0.60
Army (2898)	1578 (95.7)	1320 (95.3)	
RM (173)	86 (4.3)	87 (4.8)	
Sex (3071)			*p*=0.17
Male (2846)	1515 (94.5)	1331 (92.8)	
Female (225)	149 (5.5)	76 (7.2)	
Relationship Status (2958)			*p*=0.3
In a Long-Term Relationship (2157)	1248 (74.3)	909 (76.3)	
Not In a Long-Term Relationship (801)	413 (25.7)	388 (23.8)	
Rank (2971)			***p*<0.0001**
Senior Officer (75)	67 (2.8)	8 (0.6)	
Officer (504)	337 (14.8)	167 (11.3)	
Senior Non-Commissioned Officer - SNCO (736)	486 (33.3)	250 (28.4)	
Junior Non-Commissioned Officer - JNCO (1020)	540 (33.4)	480 (39.1)	
Junior Rank (636)	234 (15.6)	402 (20.5)	
IA vs. FU Personnel (2908)			*p*=0.51
FU Personnel (2555)	1363 (87.7)	1192 (89.1)	
IA Personnel (353)	291 (12.3)	62 (10.9)	

*P values are for Pearson chi Squared Test corrected for weighting using Rao and Scott second order corrections
**n's are shown without the composite weight applied, %s are shown with the composite weight applied

There were no significant differences in the levels of post-deployment re-adjustment problems reported by TLD attendees and controls. There were, however, significant differences in probable PTSD; approximately 3.0% of TLD attendees reported PTSD compared with 4.5% of controls (AOR 0.57 95% CI 0.36-0.91); TLD attendees were significantly less likely than controls to report MPS caseness (6.6% vs. 9.4%, AOR 0.65 95% CI 0.45-0.95). In addition, attendees were less likely than controls to report harmful levels of alcohol use (16.8% vs. 19.5% of controls, AOR 0.74 95% CI 0.54-1.00). All other differences were not significant. The results of these analyses are shown in Table 13.

Table 13. TLD Mental Health Outcomes - Attendees vs. Controls

	Study Group	
****Outcome (n)**	**Control n (%)**	**TLD n (%)**
PCL-C Score ≥50		
Case (123)	68 (4.5)	55 (3.0)
No Case (2813)	1583 (95.5)	1230 (97.0)
AOR (95% CI)	1	**0.57 (0.36-0.91)**
GHQ-12 4 Symptom Cut Off (CMD)		
Case (573)	355 (21.4)	218 (17.9)
No Case (2350)	1293 (78.6)	1057 (82.1)
AOR (95% CI)	1	0.80 (0.56-1.13)
Multiple Physical Symptoms ≥18 (MPS)		
Case (229)	140 (9.4)	89 (6.6)
No Case n (2488)	1381 (90.6)	1107 (93.4)
AOR (95% CI)	1	**0.65 (0.45-0.95)**
AUDIT Score ≥16		
Case (529)	285 (19.5)	244 (16.8)
No Case (2382)	1355 (80.5)	1027 (83.2)
AOR (95% CI)	1	**0.74 (0.54-1.00)**
Health Rating		
Excellent, Very Good or Good (1408)	764 (45.2)	644 (48.7)
Fair or Poor (1548)	894 (54.8)	654 (51.3)
AOR (95% CI)	1	1.14 (0.88-1.47)
Re-adjustment Problems		
None (1501)	900 (51.2)	601 (51.5)
One or More (1393)	755 (48.8)	638 (48.5)
AOR (95% CI)	1	0.93 (0.72-1.20)

* All ORs adjusted for Rank

To assess whether differences in mental health status might be a potential source of bias, a comparison was made between the mental health status of the TLD and non-TLD groups at baseline, represented by data collected at phase 1 of the cohort study for those subjects where data were available (TLD n= 886, Control n= 608). The results suggested that there were no significant differences between the two groups. Controls reported similar levels of PTSD, (3.1% vs. 3.1%, p= 0.93), symptoms of CMD (20.8% vs. 19.3%, p= 0.60) and MPS caseness (9.1% vs. 9.6%, p= 0.82) to TLD attendees. Levels of harmful alcohol use were also similar in both samples (18.4% vs. 20.0%, p= 0.56)

In analyses stratified by level of combat exposure, the greatest effect for TLD appeared to be within the medium combat exposure level group where attendees were significantly less likely than controls to report probable PTSD symptoms (1.8% vs. 4.7% AOR 0.35 95% CI 0.14-0.88) and MPS (5.3% vs. 10.5% AOR 0.47 95% CI 0.23-0.93). Within the lowest combat exposure level groups, attendees were less likely to report symptoms of CMD (10.8 vs. 17.7% AOR 0.57 95% CI 0.33-0.96). No significant effects for TLD were detected for readjustment or mental health among the highest combat exposure level group (Table 14). When stratified by level of combat exposure, TLD had no significant effect upon levels of alcohol use.

Table 14. Mental Health Outcomes - TLD Attendees and Controls Stratified by Level of Combat Exposure

Study Groups Stratified by Combat Exposure Level								
****Outcome**	**TLD High (n=542)**	**Controls High (n=380)**		**TLD Medium (n=349)**	**Controls Medium (n=535)**		**TLD Low (n=357)**	**Controls Low (n=737)**	**Wald Test F p=**
PCL-C Score ≥50									
Case n (%)	38 (5.7)	35 (9.0)		11 (1.8)	21 (4.7)		5 (0.9)	10 (1.4)	F=7.38 p<0.001
No Case n (%)	495 (94.3)	343 (91.0)		336 (98.2)	510 (95.3)		342 (99.1)	722 (98.6)	
AOR (95% CI)	0.59 (0.32-2.00)	1		**0.35 (0.14-0.88)**	1		0.56 (0.14-2.24)	1	
GHQ-12 4 Symptom Cut Off (CMD)									
Case n (%)	107 (24.3)	100 (26.4)		54 (17.9)	115 (22.2)		49 (10.8)	137 (17.7)	F= 3.64 p <0.01
No Case n (%)	420 (75.7)	278 (73.6)		291 (82.1)	416 (77.8)		296 (89.2)	592 (82.3)	
AOR (95% CI)	0.89 (0.52-1.54)	1		0.76 (0.42-1.39)	1		**0.57 (0.33-0.96)**	1	
Multiple Physical Symptoms ≥18									
Case n (%)	58 (11.3)	48 (14.1)		19 (5.3)	48 (10.5)		10 (2.4)	44 (5.6)	F=6.14 p <0.001
No Case n (%)	444.(88.7)	306 (85.9)		303 (95.7)	437 (89.5)		308 (97.6)	629 (94.4)	
AOR (95% CI)	0.94 (0.55-1.59)	1		**0.47 (0.23-0.93)**	1		0.52 (0.21-1.26)	1	
AUDIT Score ≥16									
Case n (%)	131 (21.9)	96 (26.4)		59 (16.9)	99 (21.1)		41 (10.8)	89 (14.2)	F=4.05 p <0.001
No Case n (%)	394 (78.1)	281 (73.4)		284 (83.1)	429 (78.9)		303 (89.2)	635 (85.8)	
AOR (95% CI)	0.61 (0.35-1.14)	1		0.72 (0.41-1.29)	1		0.74 (0.48-1.13)	1	
Health Rating									
Excellent, Very Good or Good n (%)	281 (50.6)	172 (45.0)		172 (45.2)	246 (43.7)		164 (50.4)	338 (45.2)	F=0.63 p =0.68
Fair or Poor n (%)	258 (49.4)	206 (55.0)		177 (54.8)	288 (56.3)		187 (49.6)	397 (54.8)	
AOR (95% CI)	1.24 (0.84-1.84)	1		1.06 (0.69-1.63)	1		1.20 (0.75-1.91)	1	
Re-adjustment Problems									
None n (%)	203 (37.0)	137 (34.8)		177 (51.5)	270 (44.9)		216 (68.5)	487 (65.7)	F=17.49 p <0.001
One or More n (%)	337 (63.0)	241 (65.2)		166 (48.5)	262 (55.2)		130 (31.5)	246 (34.3)	
AOR (95% CI)	0.88 (0.59-1.32)	1		0.75 (0.48-1.16)	1		0.82 (0.50-1.36)	1	

*All AORs adjusted for Rank
**n's are shown without the composite weight applied, %s, AOR and 95% confidence intervals are shown with the composite weight applied

Main Findings

This study evaluated the impact of TLD attendance upon post deployment re-adjustment, mental health and alcohol use among deployed UK AF personnel. It would have been preferable to conduct a prospective Randomised Controlled Trial (RCT) to assess these outcomes, however, at the time of this study TLD was mandatory for all personnel and it was not possible to generate a control group. When data collection for the cohort study took place, TLD was not compulsory for all deploying personnel, a group of personnel, representing a potential control group, deployed without participating in TLD even though it was available. Given the nature of the cohort dataset, a method of analysis was chosen that helped to minimise bias when using observational data. Two hypotheses were tested, firstly, personnel attending TLD would experience similar levels of psycho-social re-integration upon return to their home base to those who do not attend TLD. The main study findings suggested that TLD attendees reported similar levels of re-adjustment difficulties to non-attendees irrespective of the level of combat exposure. The null hypothesis was supported. The second hypothesis was that personnel attending TLD following operational deployment would report similar levels of symptoms of CMD, PTSD, global health, multiple physical symptoms and would experience similar levels of alcohol misuse to personnel who did not attend TLD. In this case, the null hypothesis was not supported. TLD appeared to have a greater positive impact upon symptoms of PTSD, multiple physical symptoms and harmful alcohol use, when stratified by level of combat exposure, personnel who experienced lower levels of combat exposure appeared to benefit more than those experiencing the highest levels. TLD attendance appears to have mental health benefits, these are not evenly

distributed across all personnel; combat and operational experience appears to modulate the potential impact of TLD.

CHAPTER 6 – PRIMARY AND SECONDARY PREVENTION - PSYCHOLOGICAL SUPPORT AMONG UK ARMED FORCES PERSONNEL DEPLOYED TO AFGHANISTAN IN 2010 AND 2011

Overview

Given the UK Armed Forces' increasing involvement in counter-insurgency operations and asymmetric warfare, little is known about the best ways to support mental health and wellbeing during deployment in this context. The evaluation of deployment mental health in UK Armed Forces personnel often relies upon retrospective accounts which may be subject to memory distortion. The aim of this study was therefore to examine the burden of mental ill health and the effect of primary and secondary preventative measures including operational, family, welfare and medical support using data obtained within the operational area on two occasions some eighteen months apart. 2794 personnel completed a paper survey in their deployment location or place of work whilst deployed to Afghanistan; 1431 provided data in 2010 and 1363 in 2011. Responses obtained from the two groups were compared and contrasted. The prevalence of self-reported mental health symptoms was low given the arduous operational environment and was not significantly different between the two survey points; the rates of probable PTSD were 2.8% in 2010 and 1.8% in 2011; for common mental health disorders, the rates were 17.0% and 16.0% respectively. Rates of stigmatising beliefs concerning mental health help-seeking and perceived barriers to accessing care were similar at both survey points with 49.4% of military personnel reporting three or more out of 13 potential stigmatising beliefs in 2010 and 47.1% in 2011. Sub-

threshold posttraumatic stress symptoms, but not common mental disorder symptoms, were significantly more prevalent in both samples when personnel were deployed in more austere, exposed and dangerous forward locations. Rates of reporting the highest levels of combat exposure had reduced significantly over time. 46.5% reported the highest levels of such exposure in 2010 compared with 36.8% in 2011. Following adjustment for the year of deployment, factors relating to primary prevention including remembering receiving a pre-deployment psycho-educational briefing, perceptions of good leadership and perceptions that support had been provided for the family at home were all significantly associated with better deployment mental health. Seeking support from non-medical sources and reporting sick for medical reasons were both significantly associated with poorer mental health.

Introduction

Since the start of the military campaigns in Afghanistan and Iraq, the psychological health of deployed United Kingdom (UK) military personnel has become a high profile political concern and is much reported in the media, sometimes in a distorted way. In addition, various aspects of UK military health have been explored in scientific publications including the effects of 'overstretch' where personnel are deployed for excessive cumulative lengths of time (Rona et al., 2007), high rates of alcohol misuse (Fear et al., 2007) and the gender of the deployed person (Woodhead et al., 2012). However, most of the scientific work on deployment mental health support has been conducted with personnel who are stationed in their home bases following deployment. This often results in a variable gap between returning home and completion of the

survey. Asking personnel about what happened to them on deployment may therefore be affected by various aspects of memory distortion (Engelhard and McNally, 2014).

In order to find out more about deployment mental health and its support in high threat areas, the US forces began surveying military personnel in their deployed location in 2003 (Department of the Army, 2012); in 2009, using a similar but not identical methodology, the UK surveyed deployed military personnel in Iraq (Mulligan et al., 2010). The result of this study (termed the Operational Mental Health Needs Evaluation Iraq or OMHNE I) suggested that the mental health of UK AF personnel on deployment was similar to that reported during surveys of home based personnel (Hotopf et al., 2006, Fear et al., 2010). The OMNHE I found that 20.5% of deployed personnel reported symptoms of probable CMD and 3.4% reported probable PTSD symptoms.

OMHNE I took place during the last phase of the UK's military operations in Iraq during which the operational threat level was much decreased compared to previous years; this contrasted sharply with the combat intensity experienced by UK AF personnel deployed in Afghanistan at that time. Therefore, in order to better understand the mental health impact of prolonged operations in a high threat area, a survey was carried out in the winter of 2010 amongst 1431 personnel deployed in Afghanistan (the survey was termed OMHNE A1). The results of the survey suggested that approximately 3.0% of personnel were experiencing symptoms of probable PTSD and around 17.0% reported symptoms of probable CMD. The study outcomes suggested that, in addition to low levels of stress back at home (Mulligan et al., 2012), good mental health on deployment was related to supportive factors such as team cohesion and leadership (Jones et al., 2012). To understand how changes in operational support and the deployed environment

may have impacted upon mental health, a survey of deployed personnel was carried out in Afghanistan during July and August 2011 (termed OMHNE A2). Unlike the OMHNE A1, the A2 survey was undertaken in the summer to take account of different climactic conditions and seasonal variations in combat intensity. During OMHNE A1, the study team was unable to carry out as much forward sampling as had been planned prior to deployment. This occurred because a major coalition offensive operation was underway and transport assets, particular access to helicopters was somewhat limited; no such restrictions were present during A2. Given that being in a forward area potentially limits access to potential sources of prevention including medical and welfare support, the study team sought to assess whether location and combat environment had impacted upon mental health by concentrating the survey effort in more austere, forward locations away from the main base areas.

This study compared the mental health of UK personnel who took part in the OMHNE A1 and A2 surveys whilst deployed to Afghanistan to evaluate the effect of changes over time in both the operational environment and levels of mental health support. The main focus of the study was to assess the impact upon mental health of primary prevention in the form of pre-deployment psycho-education, family and welfare support and secondary prevention in the form of medical support while taking account of the year of deployment and perceived leadership.

Study-Specific Methods

In preparation for the OMHNE studies, on both occasions the team leader carried out extensive liaison through the UK co-ordinating headquarters with senior commanders responsible for personnel and medical issues in the operational area. Upon arrival in the operational area,

further contact was made with key personnel and senior commanders. This was primarily to ensure that arrangements were in place to support the survey team and to ensure that commanders were aware of the team's visit, aims and requirements. The questionnaires and survey equipment were sent by air freight so that delivery coincided with the team's arrival and completion of a five day operational familiarisation and training package. Prior to commencing the surveys, the OMHNE teams were provided with a copy of the current personnel report to establish the disposition of the deployed force. The target sample size on both occasions was around 1200 personnel. This figure represented approximately 15% of around 9000 deployed personnel on each occasion. Approximately 1000 personnel were absent from the operational area undertaking rest and recuperation giving a true sample size of around 8000. The surveys were powered on the GHQ-12, to detect an 18 to 22% prevalence of common mental disorder with a confidence level of 95%.

Secure data storage was achieved by using a padlocked and chained metal box used for air-freighting the survey hardware and scanning equipment to the operational area. A second lockable trunk was used for the secure storage of completed questionnaires which were retained for backup purposes until all data entry was complete.

Distribution of the questionnaires was mainly conducted by the OMHNE survey teams. In most locations the local commander agreed to assemble all available personnel in a central location in order to receive a formal verbal briefing from a member of the survey team prior to the surveys being distributed. All participants were offered the opportunity to refuse participation or to withdraw at any time. This was based upon a written script. The survey procedure was endorsed

by the MoD research ethics committee (Ref: 0839/194 dated September 2008) with amendments for the current survey endorsed in September 2009. For some units conducting deployments outside the main operating base, making access to participants difficult, commanders were asked to deliver a scripted brief prior to administering the survey which was also made available in printed form for participants to read if they wished to. The completed surveys were then collated and stored securely for collection by the OMHNE team. The survey team recorded the survey location and made notes on items of interest in a blank area of the questionnaire as required. To maximise movement around the operational area and to offset any potential difficulties arising from flight logistical problems, the team undertook the survey as individuals or sometimes in pairs.

Completed surveys were scanned into a Remark™ software database, having been produced using the Remark™ software template editor with an electronic scanner. This allowed the software to 'read' the completed boxes on the questionnaire and convert them to numerical information which was transferred to a Statistical Package for Social Sciences Version 15 database (SPSS v15) for the purpose of analysis. Prior to export, data were 'cleaned' manually using the software's inbuilt utility to improve the accuracy of the scanned data when the respondent's answers had been incorrectly read. The cleaning process was performed by examining digital images of the completed questionnaire stored within the software data storage area and updating the associated dataset. The team leader then carried out a 100% fidelity check of the entered data. Once the scanned data had been cleaned and backed-up, hard copies of the questionnaires were destroyed by shredding and then burning.

During both surveys, the survey teams consisted of both military mental health professionals and general military personnel. The mental health team members were responsible for advising about mental health-related matters and the purely military members were responsible for general logistics and gave military advice to the team. Although the sampling was broadly representative of the deployed force, a decision was taken prior to each visit to over-sample groups who were deemed to be at potentially higher psychological risk, such as the Counter-IED Task Force (CIED-TF), colloquially, but not militarily, known as bomb disposal personnel, medical personnel, Special Investigations Branch (SIB) personnel who travel widely within the operational area to investigate every UK AF death, Military Police, Joint Helicopter Force and Defence Fire Service personnel who receive helicopter-borne casualties and transport them to the treatment facility. In ideal circumstances, a random sampling strategy would allow for the study findings to be reliably extrapolated to the whole deployed population as random selection helps to minimise the likelihood that the results obtained are due to confounding factors overly present or absent in the sample but not in the force as a whole. Due to operational constraints and the requirement to continually adapt the visit plan, a cluster-based, purposive sampling strategy was used during each visit to capture various groups as truly random sampling was not possible. The visit plans were drawn up prior to the team landing in the operational area and sought to ensure that personnel working in the locations to be visited and sampled were representative of the deployment profile of the overall force. Fewer forward locations were visited than planned during OMHNE A1, such as Check Points (CPs) and Patrol Bases (PBs) positioned in more austere and exposed areas. In order to maximise the forward survey focus during OMHNE A2, the survey team sought to ensure that as many forward locations as possible were visited and that personnel surveyed in relatively safe main operating bases (MOBs) were drawn from units that

undertook frequent, mostly combat or combat logistic patrols in potentially dangerous areas outside the base location.

During both surveys, fully informed signed consent to participate was obtained from respondents who gave their personal details. Others were given the opportunity to complete the survey anonymously if they wanted no further contact from the survey team. In this case, completion of the survey constituted implied consent. The survey team recorded the number of refusals but no identifiable information. The core of the survey instrument was retained between visits to ensure that a robust comparison of the two visits could be undertaken. The instrument used in the 2011 survey is contained in Appendix 2.

In both surveys, the standard mental health measures, the GHQ-12, PCL-C, subjective global health and functional impairment with the standard cut-off scores and case definitions were used. On this occasion PCL-C scores ≥30 were used to ensure that the survey captured not only probable PTSD cases, but also personnel who reported sub-threshold PTSD symptoms as these have been shown to be associated with functional impairment in previous research (Rona et al., 2009); hereafter, respondents who reported PCL-C scores ≥30 are classified as exhibiting sub-threshold PTSD symptoms and those reporting PCL-C scores of ≥50 as probable PTSD cases. To determine the association of a range of variables with mental health overall, CMD and PTSD cases were conflated to produce a single variable labelled 'any mental health disorder'.

In this study, a combat exposure variable was generated by summating any positive responses (scores greater than 0) to the 17 items of the operational experiences scale described earlier in

this thesis. Each of the operational experiences questions had a score of 0, 1, 3, 7 and 10 assigned to the five potential response options to reflect increasing frequency of exposure. The final scale had a minimum score of 0 and a maximum score of 170. Tertiles were generated from the summed scores for this scale and the middle and lower tertiles were combined so that a comparison could be made between the highest levels of combat exposure and all others.

Morale, leadership and cohesion were each assessed using the four item measures described in the general methods chapter. Each scale was dealt with in a similar manner where individual scale items were first reduced to binary variables (indicating presence or absence, endorsement or non-endorsement) and then converted to count variables. This was achieved by combining strongly agree and agree responses and strongly disagree and disagree responses. For each scale, the cut-off points were 3 out of 4 endorsements to represent high levels of each factor.

The 13 item version of the mental health stigmatisation scale was included using a cut-off point of three endorsed items to indicate higher levels of stigmatising beliefs and perceived barriers to help-seeking. The stigma/BTC scale items were grouped into three categories representing internal stigma (stigmatisation relating to the self), external (stigmatisation relating to others) and perceived barriers to care (impediments to help-seeking).

Finally, the survey contained several groups of questions regarding aspects of deployment support. This included pre-deployment preparation in the form of psycho-education, where personnel were asked 'Did you receive a stress brief prior to this deployment?' Perceptions of family and welfare support at home was assessed by asking 'Has the military provided any

reassurance or support to your family (parents, siblings, partner or spouse) whilst you have been on this deployment? (e.g. phone calls or visits, arranging 'get-togethers' with other service families, newsletters etc.). Finally, respondents were asked about the use of deployed medical support such as primary care facilities, the deployed field hospital and the frequency of use.

Analyses

The standard analytic approach was adopted whereby data were first explored using Pearson's chi squared tests and then further examined using unadjusted and adjusted univariable and multivariable logistic regression. In addition to the year of deployment, predictor variables were adjusted for socio-demographic characteristics that have been shown to be important in previous UK AF studies. These included age, Service background, engagement type and sex (Fear et al., 2010). Confounders also included those where the nature of the deployment and characteristics of the operational area might theoretically be linked to mental health such as combat exposure, deploying without other unit members, being in a relationship (reflecting potential social support), deployment location and shorter vs. longer periods spent in the operational area, reflecting potential exposure to cumulative operational stress. Confounding variables related to non-deployment factors included the presence of home front concerns (Mulligan et al., 2012), having dependant children, time spent away from home and time spent on previous deployments (Rona et al., 2007). For this study, trends in the data were examined using chi-Squared (χ^2) test for trend. Percentages and numbers shown may not add up to sample totals due to missing data.

Results

2794 personnel took part in the surveys; refusal to participate and returning spoiled or incomplete questionnaires was minimal, resulting in a response rate of 99.6% during OMHNE A1 (n=1431) and 95.8% during OMHNE A2 (n=1363). During the A2 survey, 68.7% of the participants were located in forward areas (CPs, PBs and forward operating bases (FOBs) rather than MOBs) contrasting with 35.7% in forward areas during A1 ($\chi 2$=350.54, d.f.1, p<0.001).

Socio-demographic, Military and Operational Factors

The socio-demographic characteristics of the two samples differed significantly in a number of ways. The A1 sample contained greater numbers of Army and Royal Marines and marginally fewer RAF and Royal Navy personnel than the A2 sample. Significantly greater numbers of reserve forces took part in A1 (A1 6.9% n=98 vs. A2 4.6% n=60, p<0.01). Although the age categories differed significantly, the difference in the proportions of personnel under 24 years of age, a group known to be at greater risk of mental health disorder, was not significant (A1 42.3% vs. A2 40.2%, p=0.26). A2 contained a significantly greater number of personnel with dependant children (A1 64.2% vs. A2 69.0% p<0.01), significantly fewer individual augmentees (A1 8.7% vs. A2 6.7%, p<0.05) and significantly fewer operationally experienced personnel (A1 40.0% vs. A2 50.5%, p<0.001). A2 had significantly more experienced personnel with longer lengths of service (A1 58.0% vs. A2 62.9% p=0.01). Although the proportions of the three combat role categories were significantly different in the two samples, the proportions of combat personnel (those undertaking direct combat missions, engaging the enemy and most at risk of poorer mental health) were similar (A1 53.7% n=769. A2 51.8% n=706 χ^2=1.05, d.f.1, p=0.30). The levels of general combat exposure differed significantly between the two samples. During

A1, 46.5% (n=661) of personnel reported experiences falling within the upper tertile of combat exposure compared to 36.8% (n=501) of A2 personnel (χ^2=27.09, d.f.1, p<0.001). All of the socio-demographic, military and operational variables that differed significantly between the A1 and A2 samples were treated as observed confounding variables when conducting subsequent regression analyses. When compared with whole Service data (where it was available) in both OMHNE samples, Royal Air Force and Royal Navy personnel were under-represented as were officers, senior non-commissioned officers, reserve forces and both samples were younger than would be expected in a whole force representative sample (Table 15).

Mental Health Outcomes

Overall, the mental health outcomes generated from the two surveys were not significantly different, although the prevalence of probable PTSD (caseness) was borderline non-significant with a rate of 2.8% during A1 and 1.8% during A2 (Adjusted Odds Ratio (AOR) 2.12, 95% Confidence Interval (CI) 0.99-4.53). For common mental health disorders the rate was 17.0% during A1 and 16.0% during A2 (AOR 0.90, 95% CI 0.68-1.19). 94.1% of A1 personnel rated their global health as good, very good or excellent compared with 93.3% of A2 personnel and the difference was not statistically significant. The rate of reporting a PCL-C score ≥30 was 16.5% during A1 and 14.4% during A2, which was not statistically significant, and functional impairment related to PTSD symptoms was not significantly different between the two surveys (22.2% during A1 vs. 20.2% during A2). During both deployments, PCL-C ≥30 scores (sub-threshold PTSD) were more prevalent in more austere, exposed and dangerous locations; for the combined samples the rates of symptoms in rear through to forward locations respectively were MOB 13.1%, FOB 17.1%, PB 18.2%, CP 17.8% and for those accompanying Afghanistan Army

patrols, the rate was 20.6%. There was a statistically significant trend for experiencing more sub-threshold symptoms with progressively forward deployment (χ^2 test for linear trend =7.83, $p<0.05$). CMD symptoms occurred at a similar rate irrespective of location in the operational area. Of the PCL-C ≥30 cases in both samples (n=415), 67.2% (n=279) reported being somewhat, very much or extremely functionally impaired compared to 11.9% (n=246) of non-cases (n=2063) ($\chi2$= 632.86, d.f.1 $p<0.001$). The mental health outcomes are shown in Table 16.

Table 15. Demographic and Operational Characteristics OMHNE Sample

Characteristic (n)	Category (n)	A1 n (%)	A2 n (%)	**DS	***χ^2, d.f., p
Service (2794)	Royal Navy (117)	18 (1.3)	99 (7.3)	**20.3	**χ^2=71.87, d.f.2, $p<0.001$**
	Army and Royal Marines (2446)	1313 (91.8)	1133 (83.1)	55.5	
	RAF (231)	100 (7.0)	131 (9.6)	24.2	
Rank (2790)	Junior Rank (2085)	1051 (73.4)	1034 (76.1)	60.2	χ^2=2.59, d.f.2, p=NS
	Senior Rank (392)	212 (14.8)	180 (13.2)	22.7	
	Officer (313)	168 (11.7)	145 (10.7)	17.1	
Sex (2769)	Male (2558)	1308 (91.7)	1250 (93.1)	90.4	χ^2=2.16, d.f.1, p=NS
	Female (211)	119 (8.3)	92 (6.9)	9.6	
Engagement Type (2723)	Regular Forces (2565)	1315 (93.1)	1250 (95.4)	90.9	**χ^2=6.90, d.f.1, $p<0.01$**
	Reserve Forces (158)	98 (6.9)	60 (4.6)	****9.1	
Age Group (2790)	18-24 Years (1152)	605 (42.3)	547 (40.2)	28.2	**χ^2=8.23, d.f.2, $p<0.01$**
	25-34 Years (1162)	561 (39.2)	601 (44.2)	39.6	
	35-44 Years (414)	264 (18.5)	212 (15.6)	32.2	
Relationship Status (2787)	Long-term Relationship (1834)	945 (66.2)	889 (65.4)	Data not available	χ^2=0.18, d.f.1, p=NS
	Single (953)	483 (33.8)	470 (34.6)		
Service Length (2630)	<1 Year (91)	70 (5.2)	21 (1.7)		**χ^2=27.02, d.f.4, $p<0.001$**
	2-4 Years (951)	500 (36.8)	451 (35.5)		
	5-12 Years (1030)	505 (37.2)	525 (41.3)		
	13-22 Years (461)	231 (17.0)	230 (18.1)		
	≥22 Years (97)	52 (3.8)	45 (3.4)		
Dependant children (2755)	Yes (1832)	919 (64.2)	913 (69.0)		**χ^2=6.93, d.f.1, $p<0.01$**
	No (923)	512 (35.8)	411 (31.0)		
Deployment (2794)	0-1 Previous Deployment (1533)	858 (60.0)	675 (49.5)		**χ^2=30.70, d.f.1, $p<0.001$**
	≥2 Previous Deployment (1261)	573 (40.0)	688 (50.5)		
IA or FU Personnel (2794)	Formed Unit Personnel (2578)	1306 (91.3)	1272 (93.3)		**χ^2=4.15, d.f.1, $p<0.05$**
	Individual Augmentee (216)	125 (8.7)	91 (6.7)		
Length of Time Deployed (2773)	0-4 Weeks (185)	119 (8.4)	66 (4.9)		**χ^2=171.06, d.f.4, $p<0.001$**
	5-8 Weeks (280)	200 (14.1)	80 (5.9)		
	9-16 Weeks (857)	355 (25.0)	502 (37.2)		
	17-26 Weeks (1310)	625 (44.0)	685 (50.7)		
	≥27 Weeks (141)	123 (8.6)	18 (1.3)		
Location in Operational area (2786)	Check Point (300)	0 (0.0)	300 (22.1)		**χ^2=819.62, d.f.3, $p<0.001$**
	Patrol Base (525)	82 (5.7)	443 (32.6)		
	Forward Operating Base (618)	428 (30.0)	190 (14.0)		
	*Main Operating Base (1343)	918 (64.3)	425 (31.3)		
Combat Arm or Role (2794)	Combat (1475)	769 (53.7)	740 (51.8)		**χ^2=15.85, d.f.2, $p<0.001$**
	Combat Support (506)	220 (15.4)	286 (21.0)		
	Combat Service Support (813)	442 (30.9)	371 (27.2)		
Combat Exposure (2783)	Upper Tertile (1162)	661 (46.5)	501 (36.8)		**χ^2=27.09, d.f.1, $p<0.001$**
	Middle and Lower Tertile (1621)	760 (53.5)	861 (63.2)		

*Personnel accompanying the Afghanistan Army were collapsed into the MOB category as they are often located in base areas between missions.
**DS stands for Defence Statistics
***For the difference between A1 and A2
****Deployed reserve forces.

Table 16. OMHNE Sample - Mental Health Outcomes

Mental Health Outcome	A1 n (%)	A2 n (%)
Global Health		
Excellent, Very Good or Good (2610)	1341 (94.1)	1269 (93.3)
Poor/Fair (175)	84 (5.9)	91 (6.7)
***AOR**	1	1.11 (0.72-1.70)
Common Mental Disorder		
CMD Not a Case (2320)	1179 (83.0)	1141 (84.0)
CMD Case (460)	242 (17.0)	218 (16.0)
***AOR**	1	0.90 (0.68-1.19)
PTSD		
PTSD Not a Case (2713)	1378 (97.2)	1335 (98.2)
PTSD Case (63)	39 (2.8)	24 (1.8)
***AOR**	1	2.12 (0.99-4.53)
Sub-threshold PTSD Symptoms		
Sub-threshold PTSD Symptoms (PCL Cut Off ≤29) (2346)	1183 (83.5)	1163 (85.6)
Sub-threshold PTSD Symptoms (PCL Cut Off ≥30) (430)	234 (16.5)	196 (14.4)
***AOR**	1	1.27 (0.94-1.70)
Functional Impairment		
No Functional Impairment (1955)	957 (77.8)	998 (79.8)
Somewhat very or extremely Functionally Impaired (525)	273 (22.2)	252 (20.2)
***AOR**	1	1.03 (0.79-1.35)
Stigmatising Beliefs and Barriers to Care (2620)		
Stigmatising Beliefs and Barriers to Care ≤2 Item (1354)	681 (50.6)	673 (52.9)
Stigmatising Beliefs and Barriers to Care ≥3 Items (1266)	666 (49.4)	600 (47.1)
***AOR**	1	1.09 (0.88-1.34)

*AOR Adjusted for data capture during 2010 vs. 2011, Rank, Service Background, Engagement Type, Individual Augmentee vs. Formed Unit, Sex, Relationship Status, Dependant children, CP and PB vs. FOB and MOB, Combat Exposure, previous tours, shorter vs. longer period in operational area, Family Support, Good vs. Poorer Leadership.

Perceived Stigmatisation and Perceived Barriers to Care Scale Components

Similar numbers of survey respondents reported three or more stigmatising beliefs about having a mental health problem (stigma) and/or barriers to care (BTC) at both survey points, (A1 49.4% vs. A2 47.1%, AOR 1.09, 95% CI 0.88-1.34). Any mental health disorder caseness was significantly associated with reporting ≥3 stigma/BTC items at both assessment points (A1 cases: 69.5% (n=169) vs. 45.0% non-cases (n=495), $\chi 2=47.8$, d.f.=1, $p<0.001$), (A2: 65.9 (n=139) vs. 43.4% non-cases (n=460) , $\chi 2=35.8$, d.f=1, $p<0.001$). (Table 16)

Responses given by A1 and A2 participants to each of the 13 items that constituted the perceived stigmatisation and barriers to care scale were compared and stigma/BTC were found to be consistently reported at similar levels with the exception of firstly, beliefs about potential breaches of confidentiality if mental health support were to be sought and secondly, not knowing where to get help. Both items were reported at significantly lower levels during the later deployment. Additionally, the rank order of stigma/BTC items within the three categories, internal stigma, external stigma and perceived barriers to care, were similar at both survey points. (Table 17)

Table 17. OMHNE Sample - Stigmatising Beliefs and Barriers to Care

*Stigmatisation and Perceived Barriers to Care Items	OMHNE(A1) n (%)	OMHNE (A2) n (%)	X^2 d.f. *p*
Internal Stigmatisation			
Members of my unit might have less confidence in me	611 (45.4)	549 (43.4)	χ^2=0.12 d.f.1 *p*=0.29
My unit leaders might treat me differently	590 (44.3)	550 (43.3)	χ^2=0.13 d.f.1 *p*=0.72
I would be seen as weak by those who are important to me	483 (36.0)	434 (34.3	χ^2=0.81 d.f.1 *p*=0.37
Seeking help would be too embarrassing	344 (25.6)	292 (22.9)	χ^2=2.65 d.f.1 *p*=0.10
If I sought help it would harm my career	398 (29.6)	376 (29.6)	χ^2=0.00 d.f.1 *p*=1.00
External Stigmatisation			
People with mental illness should not be given any responsibility	500 (37.1)	439 (34.4)	χ^2=2.15 d.f.1 *p*=0.14
I would think less of a team member if they receive MH care	154 (11.5)	145 (11.5)	χ^2=0.00 d.f.1 *p*=1.00
Perceived Barriers to Care			
There would be difficulty getting time off of duty	399 (29.9)	352 (27.7)	χ^2=1.49 d.f.1 *p*=0.22
My visit would not remain confidential	285 (21.2)	225 (17.8)	**χ^2=4.76 d.f.1 *p*<0.05**
I don't know where to get help	170 (12.6)	117 (9.2)	**χ^2=7.97 d.f.1 *p*<0.01**
I don't trust mental health professionals	144 (10.7)	135 (10.6)	χ^2=0.01 d.f.1 *p*=0.94
My leaders discourage the use of MH services	56 (4.2)	54 (4.3)	χ^2=0.02 d.f.1 *p*=0.90
I have had previous bad experience of MH professionals	57 (4.3)	54 (4.3)	χ^2=0.00 d.f.1 *p*=1.00

*Stem question - Here is a list of concerns that you might have when considering seeking help for a stressful, emotional, mental health or family problem. Please rate each of the possible concerns that might affect YOUR decision to receive help.

Leadership, Morale and Cohesion

Subjective impressions of leadership were generally high and remained fairly constant across the two surveys. 67.1% of personnel endorsed ≥3 out of 4 positive leadership statements during A1 compared to 66.7% during A2 (*p*=0.80). Despite continued high levels of endorsement, the proportion of personnel reporting that their leaders showed concern for their safety had fallen significantly from 91.3% during A1 to 89.0% during A2. For perceptions of unit cohesion, 70.5% endorsed ≥3 out of 4 positive cohesion statements during A1 compared to 67.7% during A2 (*p*=0.12). All morale items were endorsed at lower levels during A2, however, the proportion of respondents endorsing the highest levels of morale, represented by the

endorsement of ≥3 out of 4 positive morale statements increased from 70.0% during A1 to 76.5% during A2 (p<0.001). The detail of the responses given to the leadership, cohesion and morale scale items is shown in Table 18.

Table 18. OMHNE Sample - Leadership, Morale and Cohesion

Characteristic	Agree/Strongly Agree		χ^2, d.f., p
	*OMHNE(A1) n (%)	OMHNE A2 n (%)	
Leadership 'my leaders never or seldom…'			
Embarrass unit members in front of others	953 (67.3)	957 (70.5)	χ^2=3.35, d.f.1, *p=0.07*
Accept extra unit duties in order to impress their seniors	746 (52.9)	732 (54.4)	χ^2=0.63, d.f.1, *p=0.43*
Leadership 'my leaders often or always…'			
Treat all members of the unit fairly	1161 (82.2)	1084 (80.1)	χ^2=1.89, d.f.1, *p=0.17*
Show concern about the safety of unit members	1294 (91.3)	1204 (89.0)	**χ^2=4.25, d.f.1, *p<0.05***
Three or more **Leadership** items endorsed	952 (67.1)	905 (66.7)	χ^2=0.06, d.f.1, *p=0.80*
Cohesion			
Feel a sense of comradeship with others in my unit	1307 (92.4)	1235 (91.2)	χ^2=1.23, d.f.1, *p=0.27*
Able to go to most people in unit with personal problem	1000 (70.6)	999 (73.7)	χ^2=3.31, d.f.1, *p=0.07*
My seniors are interested in what I do or think	1046 (73.1)	957 (70.8)	χ^2=3.52, d.f.1, *p=0.06*
I feel well informed about unit matters	884 (62.4)	837(62.0)	χ^2=0.55, d.f.1, *p=0.82*
Three or more **Cohesion** items endorsed	1000 (70.5)	921 (67.7)	χ^2=2.46, d.f.1, *p=0.12*
Morale			
Morale within the unit has generally been high	996 (88.8)	1054 (77.6)	**χ^2=54.17, d.f.1, *p<0.001***
The unit has been motivated and enthusiastic	997 (91.4)	1103 (81.3)	**χ^2=50.10, d.f.1, *p<0.001***
The unit has been operating efficiently	1136 (93.3)	1159 (85.7)	**χ^2=39.58, d.f.1, *p<0.001***
I have felt good about being part of this unit	966 (88.3)	1057 (78.1)	**χ^2=43.74, d.f.1, *p<0.001***
Three or more **Morale** items endorsed	940 (70.0)	1040 (76.5)	**χ^2=14.83, d.f.1, *p<0.001***

Operational, Welfare and Medical Support

When the components of operational support were examined, the proportion of personnel who remembered receiving pre-deployment stress briefings rose significantly from 75.3% during A1

to 81.1% during A2 (p<0.001), although the rate of taking R&R and finding it helpful remained constant at around 95% (p=0.57). Subjective impressions of family support remained stable with two thirds of personnel reporting that families at home had received at least some level of family support at both time points (p=0.56); over half of all personnel felt that this support was sufficient at both survey points. Significantly more personnel (37.0%) had reported sick on at least one occasion during A2 than during A1 (29.3%) (p<0.001). The proportion of personnel admitted to the field hospital had also risen significantly from 4.6% during A1 to 7.9% during A2 (p<0.001) (Table 19).

Table 19. OMHNE Sample - Operational and Family, Welfare and Medical Support

Medical and Welfare Support n (%)	**A1 n (%)**	**A2 n (%)**	**χ^2, d.f., *p***
Pre-Operational Stress Brief (2755)			
Received a Pre-Operational Stress Brief 2152 (78.1)	1052 (75.3)	1100 (81.1)	**χ^2=13.60, d.f.1, *p<0.001***
No Pre-Operational Stress Brief Received 603 (21.9)	346 (24.7)	257 (18.9)	
Rest and Recuperation (R&R) (1779)			
R&R Taken and Not Found Useful 88 (4.9)	42 (4.7)	46 (5.2)	χ^2=0.33, d.f.1, *p=0.57*
R&R Taken and Found Useful 1691 (95.1)	860 (95.3)	831 (94.8)	
Family Support (2269)			
Family Support Not Given 745 (32.8)	338 (34.0)	407 (31.9)	χ^2=1.16, d.f.2, *p=0.56*
Family Support Given Not Sufficient 359 (15.8)	154 (15.5)	205 (16.1)	
Family Support Given and Sufficient 1165 (51.3)	501 (50.5)	664 (52.0)	
Welfare and Non-Medical Mental Health Support (2735)			
No Help Sought 2376 (86.9)	1215 (85.4)	1161 (88.5)	**χ^2=5.78, d.f.2, *p<0.05***
Sought Help 359 (13.1)	208 (14.6)	151 (11.5)	
Reporting Sick for Medical Reasons (2783)			
Reported Sick 920 (33.1)	417 (29.3)	503 (37.0)	**χ^2=18.54, d.f.1, *p<0.001***
Did Not Report Sick 1863 (66.9)	1006 (70.7)	857 (63.0)	
Field Hospital Admission (2777)			
Field Hospital Admission 173 (6.2)	66 (4.6)	107 (7.9)	**χ^2=12.73, d.f.1, *p<0.001***
Not Admitted to Hospital 2604 (93.8)	1358 (95.4)	1246 (92.1)	

Help-seeking Categories

The samples were combined to examine the source of support that was sought out when personnel made the decision to seek help for a stressful, emotional, family or relationship problem. The most frequently accessed help source was a friend while the unit medical officer was least frequently sought out (Table 20).

Table 20. OMHNE Sample - Help-seeking Categories

Source of Help	n (%)
Friend	244 (8.7)
Chain of Command	123 (4.4)
TRiM Practitioner	96 (3.4)
Chaplain	60 (2.1)
Paramedical	20 (0.7)
Medical Officer	12 (0.4)

*TRiM is Trauma Risk Management, a dedicated system of peer support that is activated following exposure to a potentially traumatising event.

Support for Families

During OMHNE A2, survey respondents were given the opportunity to provide free text comments about the perceived provision of support for families. Comments were received from 14.8% (n=201) of personnel (Table 21). The majority of comments referred to a lack of information transmitted from the parent military unit to family members, particularly to those that live 'off-base' in their own accommodation rather than married quarters provided by the military. There was a perception that welfare support was focused on married personnel with children and that the military viewed and treated non-married partnerships differently. The

remaining comments were fewer in number and related to welfare provision in the operational area including telephone and internet access, difficulties supporting IA personnel, problems supporting the families of mobilised reserves, problems with support when the spouse was also serving in the military, difficulties with travel to unit events for families and general dissatisfaction with support arrangements.

Table 21. OMHNE Sample - Qualitative Analysis of Free Text Comments about Support Provision for Families

Theme of Comment	**Frequency % (n)***
Insufficient information/contact from Parent Unit to family	35% (71)
General dissatisfaction	12% (24)
Insufficient contact/support as family live off-base	19% (38)
Welfare focuses on married personnel with children and treats non-married partnerships differently	14% (28)
Miscellaneous comments	4% (8)
In-operational area welfare provision is insufficient (phone and internet)	4% (9)
Poor provision to individual augmentee personnel	4% (9)
Poor provision to reserve families	3% (7)
Insufficient as spouse also military	2% (4)
Dissatisfaction with travel arrangements for family to events	1% (3)
Total (n)	201

Column % total may not equal 100% due to rounding

In response to the question asking whether family support was sufficient or not, half of the survey respondents felt that support for families was sufficient. Personnel who thought that their

families had either not received any support or had not been sufficiently supported during their deployment were significantly more likely to be GHQ cases (χ^2=10.45, d.f.=1, p=0.001) but not PCL cases.

Operational Support and Mental Health Caseness – Adjusted Regression Analyses

After adjusting for year of deployment and a range of additional observed confounding variables, the results of the regression analyses suggested that those who did not recall receiving a pre-deployment stress brief (21.9%, n=603), and those who took R&R but did not find it helpful (4.9%, n=88 of those who took R&R) reported poorer mental health. The R&R findings became borderline non-significant when adjusted for all confounding variables included in the model. Better mental health was associated with reporting the highest levels of perceived leadership. Perceived adequate support to families at home was associated with better mental health; those who sought out support for a stressful, family or emotional problem from non-medical sources during deployment were more likely to report mental health problems, as were personnel who reported sick for medical reasons and those who were admitted to the field hospital. Despite the substantial differences in the levels of combat exposure and the variations in deployment location between OMHNE A1 and A2, the year of deployment had no modifying effect upon any of the support variables examined. The adjusted logistic regression analyses are shown in Table 22.

Table 22. The Relationship of Operational Support to PTSD or CMD Caseness

Factors (n)	PTSD or CMD Caseness		OR 95% CI	[1]AOR 95% CI	[2]AOR 95% CI	[3]AOR 95% CI	[4]AOR 95% CI	[5]AOR 95% CI
	No Case	Case						
Pre-Operational Stress Brief (2747)								
Received Pre Deployment Stress Brief Received (2145)	1800 (83.9)	345 (16.1)	1	1	1	1	1	1
No a Pre Deployment Stress Brief (602)	478 (79.4)	124 (20.6)	**1.35 (1.08-1.70)**	**1.34 (1.07-1.69)**	**1.41 (1.11-1.78)**	**1.36 (1.05-1.75)**	**1.29 (1.02-1.63)**	**1.40 (1.06-1.84)**
Rest and Recuperation (R&R) (1773)								
R&R Taken and Found Useful (1686)	1417 (84.0)	269 (16.0)	1	1	1	1	1	1
R&R Taken and Not Found Useful (87)	64 (73.6)	23 (26.4)	**1.89 (1.16-3.10)**	**1.97 (1.21-3.20)**	**1.80 (1.07-3.03)**	**1.77 (1.00-3.15)**	**1.74 (1.05-2.88)**	1.72 (0.94-3.17)
Leadership (2767)								
1-2 Leadership Items Endorsed (Lower) (918)	673 (73.3)	245 (26.7)	1	1	1	1	NA	1
3-4 Leadership Items Endorsed (Higher) (1849)	1622 (87.7)	227 (12.3)	**0.38 (0.31-0.47)**	**0.38 (0.31-0.47)**	**0.38 (0.30-0.47)**	**0.36 (0.28-0.45)**		**0.35 (0.28-0.45)**
Family Support (2262)								
Family Support Not Given or Insufficient (1099)	887 (80.7)	212 (19.3)	1	1	1	NA	1	1
Family Support Given and Sufficient (1163)	1004 (86.3)	159 (13.7)	**0.66 (0.53-0.83)**	**0.66 (0.53-0.83)**	**0.68 (0.54-0.86)**		**0.72 (0.57-0.90)**	**0.73 (0.58-0.93)**
Welfare and Non-Medical Mental Health Support (2725)								
No Help Sought (2368)	1997 (84.3)	371 (15.7)	1	1	1	1	1	1
Sought Help (357)	262 (73.4)	95 (26.6)	**1.95 (1.51-2.53)**	**1.94 (1.50-2.52)**	**1.77 (1.35-2.32)**	**1.98 (1.48-2.65)**	**1.89 (1.45-2.46)**	**1.73 (1.27-2.37)**
Field Hospital Admission (2769)								
Not Admitted to Hospital (2596)	2170 (83.6)	426 (16.4)	1	1	1	1	1	1
Field Hospital Admission (173)	126 (72.8)	47 (27.2)	**1.90 (1.34-2.70)**	**1.93 (1.36-2.74)**	**1.76 (1.20-2.56)**	**1.86 (1.25-2.77)**	**1.84 (1.28-2.63)**	**1.64 (1.05-2.56)**
Reporting Sick for Medical Reasons (2775)								
Did Not Report Sick (1858)	1585 (85.3)	273 (14.7)	1	1	1	1	1	1
Reported Sick (917)	**717 (78.2)**	**200 (21.8)**	**1.62 (1.32-1.98)**	**1.64 (1.34-2.01)**	**1.65 (1.34-2.05)**	**1.59 (1.27-2.00)**	**1.53 (1.24-1.88)**	**1.55 (1.21-1.98)**

[1]AOR Adjusted for 2010 vs. 2011
[2]AOR – Adjusted for Rank, Service Background, Engagement Type, Individual Augmentee vs. Formed Unit, Sex, Relationship Status, Dependant children, CP and PB vs. FOB and MOB, Combat Exposure, Previous Tours, Shorter vs. Longer Period in the Operational Area
[3]AOR – Adjusted for Family Support
[4]AOR – Adjusted for Higher vs. Lower Levels of Perceived Leadership
[5]AOR – Adjusted for All Confounders

Main Findings

The OMHNE study results suggest that general mental health and mental health stigmatisation and perceived barriers to care levels were stable across two survey points some 18 months apart despite the level of reported combat exposure reducing significantly from survey one to survey two. In both samples, sub-threshold PTSD symptoms and associated functional impairment were more prevalent in forward areas. Three main hypotheses were tested; firstly, levels of CMD and PTSD would be similar amongst personnel who received a pre-deployment mental health psycho-educational brief and those that did not. Secondly, mental health effects would be similar among those who perceived that their families received satisfactory levels of support provision while they were deployed versus those personnel who perceived that their families received inadequate or no support. Thirdly, psychological outcomes would be similar among those who rated their leader's behaviour in a positive manner and those who perceived that their leaders were less effective during deployment. The null hypotheses were all rejected; primary prevention in the form of direct operational mental health support including memorable pre-deployment stress briefs, perceptions of good family support and perceived good leadership were all associated with better mental health at both survey points, however, in both samples, those seeking help from both non-medical and medical sources were more likely to experience poorer mental health.

CHAPTER 7 – PRIMARY AND SECONDARY PREVENTION IN A NON-DEPLOYED SAMPLE OF UK ARMY PERSONNEL

Overview

When Service personnel are serving in their home base, mental health care and support is freely available and yet only a small proportion access help when they experience symptoms of mental ill-health. One major impediment to initiating help-seeking is the presence of stigmatising beliefs about seeking support for mental health problems and perceived barriers to care (stigma/BTC). Secondary prevention activity in the non-deployed setting is focused upon facilitating care access by overcoming the effects of stigma/BTC through a variety of means. In both deployed and non-deployed settings, Stigmatising beliefs and BTC are commonplace among military personnel, yet how they influence help-seeking is unclear. This study sought to explore the role of stigma/BTC in mental health help-seeking among British Army personnel while they were serving in their home base. Mental health and alcohol use were assessed by way of a questionnaire in a randomly selected sample of 484 personnel undertaking preparation for deployment and non-deployed duties. In addition, personnel were evaluated for stigma/BTC levels, help-seeking behaviour, related perceptions of care and mental health-related beliefs.

On brief screening measures, 35.0% of respondents screened positive for potentially harmful alcohol use, 25.2% for CMD symptoms and 12.4% screened positive for probable PTSD symptoms. Mental health stigmatisation and perceived barriers to care was significantly associated with probable mental health caseness but not alcohol misuse. 40.0% of

symptomatic personnel and 70.3% of potentially harmful alcohol misusers had not sought help of any kind despite recognising a requirement for additional support when symptoms of mental disorder were present. More than 80% of probable mental health cases felt that seeking support was helpful or necessary to resolve mental illness and that help-seeking required courage or strength. When help was sought, non-medical sources were accessed more frequently than military medical services. Greater levels of stigma/BTC were associated with both interest in and actually receiving support. Friends or family were the commonest preferred and actual help source; unit commanders were among the least preferred but were the second most commonly accessed help source. The results of this study suggest that perceptions about the potential negative occupational and social consequences of help-seeking and current mental health status may influence the decision to seek support and are a central concern for those attempting to put in place secondary prevention strategies.

Introduction

The introduction to this thesis described how supporting the mental health of Service personnel is a key component of military command efforts to ensure that the UK fighting force is operationally effective. Unlike deployment settings, when Service personnel are serving in their home base, mental health care and support is freely available and yet only a small proportion of those affected by symptoms of mental ill-health appear to access help (Iversen et al., 2011). Theoretically, reduced help-seeking may be related to stigmatising beliefs about seeking support for mental health problems and perceived barriers to care (stigma/BTC). Secondary prevention efforts put in place during the preparatory phase of the deployment cycle are often focused upon facilitating care access by overcoming the effects of stigma/BTC through a variety of means.

Conflicting evidence exists for a direct causal relationship between the decision to access care and stigma/BTC (Britt and McFadden, 2012). Furthermore, there is sometimes contradictory information about how stigma/BTC might exert an effect when military personnel decide whether to seek help. This study sought to examine the association of stigmatising beliefs, perceived barriers to care, mental health symptoms and mental health help-seeking in UK military personnel. A secondary aim was to define the nature of any such relationship. The reason for choosing to conduct the research among military personnel serving in a garrison setting was that this area is under-researched with most studies evaluating deployment-related stigma/BTC and the mental health effects of deployment. This study also contributes directly to the overall picture of the three levels of prevention across the deployment cycle, the main focus of this thesis. The intention was to generate proposals designed to minimise the risk of non-engagement and associated occupational dysfunction so that effective mechanisms to engage symptomatic personnel with therapy or support could be found.

Study Specific Methods

Study participants were serving members of the British Army (BA) who provided baseline information prior to voluntarily participating in the evaluation of a stigma reduction intervention. The survey instrument used in the study was deliberately designed to capture detailed information about help-seeking behaviours and intent so that a planned secondary analysis of the relationship between help-seeking and a range of influencing factors could be undertaken. The study took place at an Army base in the UK where the soldiers took part in a stigma reduction study. Participants were randomly selected a priori by clusters which represented various areas of employment and shared roles within the larger military unit.

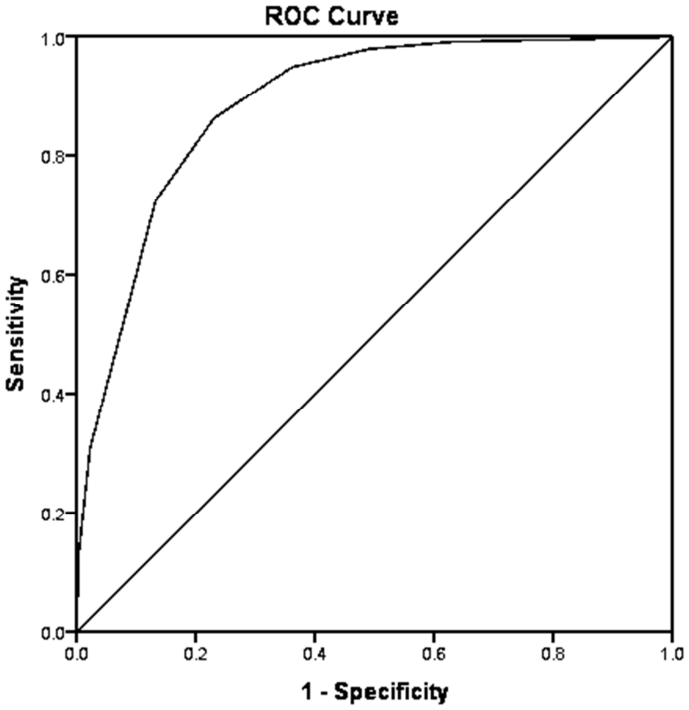
They then received either a comedy show with an active stigma reduction component or a standard comedy show (Jones et al., 2014). They were informed that their responses would be used for further research purposes, they were offered the opportunity to withdraw prior to providing baseline information and gave consent to participate. Participants completed a questionnaire which enquired about demographic characteristics, current mental health symptoms, stigmatising beliefs about help-seeking for mental health problems and potential barriers to care (hereafter termed 'stigma/BTC'). In addition they were asked about potential discriminatory behaviour in relation to other people with mental health problems, how they viewed their personal role in managing mental health symptoms, current levels of help-seeking, the sources of mental health support that they had accessed and the sources of help that they would prefer to use should a mental health problem occur in the future. The study was approved by the Ministry of Defence Research Ethics Committee - study number 315/GEN/12).

Measures

The mental health measures used in this study were selected for brevity as the survey was potentially lengthy, having pre- and post-intervention sections, and possibly onerous for potential respondents. Mental health indices included current levels of alcohol use which was assessed using the AUDIT-C. As normative data for a military population was not available for the AUDIT-C, data derived from the King's Centre for Military Health Research Cohort was used to assess the optimal cut-off score. The King's cohort was described in the third location decompression study chapter. Of 9838 cohort members, 1323 (13.5%) had scores ≥16 on the 10 item Alcohol Use Disorders Identification Test (AUDIT-10). An AUDIT-C was generated for the cohort sample by extracting and summating scores given to the first

three items of the AUDIT-10. A receiver operating characteristic curve (ROC) was generated to assess the performance of various scores on the AUDIT-C in identifying cases of alcohol use potentially harmful to health represented by scores of ≥16 on the AUDIT-10 (Figure. 5). For a score of 8.5 on the AUDIT-C, case identification sensitivity was .86 and 1-specificity was .23. The area under the curve (AUC) was 0.89 (Standard error =0.004). Scores of ≥16 on the AUDIT-10 were broadly equivalent to scores of ≥8 on the AUDIT-C. Given the high prevalence of alcohol use disorders in the UK AF (Greenberg et al., 2011), a higher AUDIT-C cut off score of ≥8 rather than the recommended score of ≥4 was used to indicate the presence of a level of alcohol use potentially harmful to health.

Figure 5. AUDIT-C, AUDIT-10 Receiver Operating Characteristic Curve



Symptoms of common mental disorder (CMD) were assessed using the GHQ-12 with standard cut-off scores used to indicate caseness. Symptoms of PTSD were assessed using the PC-PTSD; endorsing three or more symptoms on this measure indicated the presence of symptoms of probable PTSD. An inspection of the data showed that GHQ-12, PC-PTSD and

AUDIT-C scores were not normally distributed and although attempts were made, they could not be transformed to normal distributions. When examined as continuous measures, GHQ-12 scores were positively and significantly correlated with PC-PTSD scores (Spearman's rho= 0.44, $p<0.001$) but not with AUDIT-C scores (Spearman's rho= -0.10, $p=0.83$). PC-PTSD scores were not significantly correlated with AUDIT-C scores (Spearman's rho= 0.01, $p=0.79$). Given the association between the two mental health outcomes, a variable was generated combining probable PTSD or CMD caseness (termed any mental health problem) to assess the association of stigma/BTC and other variables with symptoms of generalised mental ill-health. As it appeared to be measuring a unique behavioural outcome not necessarily related to psychological symptoms, AUDIT-C caseness was not included in the composite variable.

As stigma/BTC constituted the main dependent variable in this study, prevailing levels of these beliefs were assessed using an 11 item version of the stigma/BTC scale. The adaptation for the current study included the deletion of four items which did not apply to UK samples, including cost of care, arranging transport, scheduling appointments and getting time off work. In the UK military, logistics and work absence are provided for and care is free. Two further items were not included as they were rarely endorsed in previous UK military surveys (Mulligan et al, 2012) and instead four items were included. These were the availability of services, thinking less of colleagues, lack of military support for mental health problems and giving responsibility to those with mental health problems, all of which have been used to assess military samples (Kim et al., 2010; Sipos et al., 2012). Respondents were asked to rate their strength of agreement with each stigma or BTC item using a four-point Likert scale which yielded scores ranging from 11–44. Item 2, 'the military supports Service members who have mental health problems' was reverse scored and transformed so that the scoring

format corresponded to other scale items where higher scores indicated greater levels of stigma/BTC. The stigma/BTC scale was then summed and tertiles were generated; lower and middle tertiles were combined to compare the highest levels of stigma/BTC with lower levels. In addition, strongly agree and agree responses were combined for each stigma scale item as were strongly disagree and disagree responses. This produced a binary variable for each stigma/BTC item. A count variable was generated, giving a scale ranging from 0-11. Agreeing with three or more items was used to give an estimate of high levels of stigma/BTC (Osorio et al., 2012).

As discrimination toward people with mental health conditions is sometimes viewed as a component of stigma/BTC, potential discriminatory behaviour directed at people with mental health problems was assessed using items five to eight of the Reported and Intended Behaviour Scale (RIBS). The scale was summed to give a range of scores from 4 to 20 with lower scores reflecting greater levels of potential discrimination. Tertiles were then generated and the middle and upper tertiles were combined so that greater levels of potential discrimination (the lower tertile) could be compared with lower levels (the middle and upper tertiles). To estimate levels of agreement, both agreement categories were combined as were the disagreement categories, while don't know' responses were recoded to neutral and deleted. This allowed for the production of a binary variable for each RIBS item.

As identified in the introduction, recent research suggests that military personnel who experience mental health problems often report that they wish to manage their symptoms themselves. Participants were asked to consider five statements currently being developed for use in military studies regarding their view of an individual's role in managing their own mental health. These were: 'mental health support can be helpful for those who need it'; 'it

takes courage or strength to get treatment for a psychological problem'; 'I would prefer to manage my problems on my own'; 'strong people can resolve psychological problems by themselves' and 'psychological problems tend to work themselves out without help'. Respondents were asked to rate their strength of agreement with each item using a four-point Likert scale which yielded scores ranging from 5–20; lower scores indicated greater agreement with the five statements, therefore, a more substantial personal role in managing mental health problems. The scale was first summed, tertiles were generated and the lower and middle tertiles were combined so that those rating their personal responsibility for or role in managing mental health less markedly (the upper tertile), could be compared with those who felt that self-management and personal responsibility were more important (the middle and lower tertiles). To estimate levels of agreement, both agreement categories were combined as were the disagreement categories, which allowed for the production of a binary variable for each personal responsibility scale item.

Personnel were asked if they were currently accessing support for a stressful, emotional or family problem and if they were currently interested in receiving support. They were asked to consider nine potential help sources which represented military medical assistance (mental health professional, regimental medical officer or doctor and other medical staff) and non-medical help (friend or family, unit chain of command, colleague, Trauma Risk Management (TRiM) practitioner, chaplain and Big White Wall therapist support). TRiM practitioners are military peers serving in the same unit as the help-seeker who are trained to provide support following exposure to traumatic events (Greenberg et al., 2010); the Big White Wall is an online support, information and early intervention service for people experiencing psychological distress which has been adapted for use by those with a history of military

service (www.bigwhitewall.com, 2013). Participants were asked whether they would be willing to use these sources of help in the future.

Analysis

The study was powered to detect a change of plus or minus 5% in reporting one or more stigma scale items among 212 personnel with 95% confidence. Osorio et al (2012) reported that stigma at this level has a mean frequency of approximately 60% among deployed military personnel. All analyses were conducted in the Statistical Package for Social Sciences (SPSS) version 20. The standard approach to analysis was undertaken using Pearson's chi squared test to explore categorical data. Adjusted univariable and multinomial logistic regression was used to assess data and the Wald test was used to assess the significance of explanatory variables. Adjusting variables included rank categorised into three groups (Junior Rank, Senior Rank and Officer), age grouped into five categories, service length grouped into five categories, sex, being in a relationship or not and being deployed in the last year or not. Numbers and percentages of those who returned a valid answer are reported in this study, whereas missing data are not. The proportion of missing data varied by survey item and percentages and numbers may not sum to sample and sub-sample totals. Statistical significance was $p \leq 0.05$ throughout.

Results

594 survey questionnaires were distributed, 110 were not returned or returned blank giving an overall response rate of 81.5% (n=484).

Sample Description

51.6% (n=248) of respondents were aged 18-23 years and 48.4% (n=233) were aged 24 years and over. At the time of the survey, official statistics give the median age of the Army as 29 years (www.DASA.mod.uk., 2012); for the study sample the median age was 25 years. 51.4% (n=237) had short service lengths of 0-4 years and 48.6% (n=224) had served for five years or more. The study sample consisted primarily of regular forces rather than reserves (98.3%) and most participants were male (95.1%); official statistics suggest that regulars should comprise 83.6% of a representative sample and 90.3% should be males. 79.8% (n=383) were junior ranks (Private soldier and Lance Corporal equivalent) whereas 53.3% would normally be expected. 28.5% (n=138) had completed ≥2 operational tours and 50.6% (n=245) had not deployed at the time of the study. There were no statistically significant differences in the highest levels of stigma/BTC within the various socio-demographic categories (Table 23).

Table 23. Non-deployed Help-seeking Study - Socio-Demographic and Operational Characteristics

Socio-Demographic Factors	n (%)	*High Stigma/BTC n (%)	χ^2, d.f., *p*
Age (n=481)			
18-19	50 (10.4)	16 of 48 (33.3)	χ^2=3.35 d.f. 4, *p*=0.50
20-24	198 (41.2)	50 of 188 (26.6)	
25-29	116 (24.1)	39of 112 (34.8)	
30-34	77 (16.0)	25 of 73 (34.2)	
35+	40 (8.3)	14 of 39 (35.9)	
Service Length (n=461)			
< 1 Year	38 (8.2)	7 of 36 (19.4)	χ^2=5.42, d.f. 4, *p*=0.25
2-4 Years	199 (43.2)	57 of 190 (30.0)	
5-12 Years	183 (39.7)	63 of 174 (36.2)	
13-22 Years	36 (7.8)	9 of 36 (25.0)	
≥ 22 Years	5 (1.1)	1 of 5 (20.0)	
Engagement Type (n=480)			
Regular	472 (98.3)	144 of 453 (31.8)	χ^2=2.78, d.f. 1, *p*=0.10
Reserve	8 (1.7)	0 of 6 (0.0)	
Sex (471)			
Male	448 (95.1)	132 of 430 (30.7)	χ^2=0.77, d.f. 1, *p*=0.38
Female	23 (4.9)	8 of 20 (40.0)	
Relationship Status (n=481)			
Not In a Long-Term Relationship	180 (37.4)	47 of 173 (27.2)	χ^2=1.10, d.f. 1, *p*=0.16
In a Long-Term Relationship	301 (62.6)	96 of 287 (33.4)	
Rank (n=483)			
Junior Rank	302 (62.5)	132 of 419 (31.6)	χ^2=3.73, d.f. 2, *p*=0.16
Junior Non-Commissioned Officer - JNCO	138 (28.6)		
Senior Non-Commissioned Officer - SNCO/WO	36 (7.5)	12 of 36 (33.3)	
2nd Lt-Maj	6 (1.2)	0 of 0 (0.0)	
Lt Col and Above	1 (0.2)		
Previous Deployments (n=484)			
None	245 (50.6)	73 of 234 (31.2)	χ^2=0.24, d.f. 2, *p=0.*99
1	101 (20.9)	31 of 97 (32.0)	
≥2	138 (28.5)	41 of 132 (31.1)	

*Upper Tertile of Stigma/BTC Scale Total Score. The proportion of those returning a valid response is shown.

Mental Health Outcomes, Help-Seeking and Sources of Help

25.2% (n=112) of respondents reported symptoms of CMD, 12.4% (n=55) screened positive for probable PTSD and 35.0% (n=155) screened positive for levels of alcohol use potentially harmful to health. 42.9% (n=48) of the CMD cases had not sought help; of those that had and who reported a help source, non-medical sources of support were more commonly accessed than military medical. Of the probable PTSD cases, 32.7% (n=18) had not sought help; among PTSD help-seekers, non-medical sources were more commonly accessed than military medical. 70.3% (n=109) of probable harmful alcohol users had not sought help; of those seeking help for an alcohol problem, non-medical support was more frequently accessed than military medical support (Table 24). A proportion of personnel reported that they had sought help but did not specify a help source. Of those who screened positive for either CMD or PTSD, termed any mental health problem (28.4%, n=137), 57.6% had sought help (n=76 of 132 who reported their help-seeking status). 10.0% (n=46 of 460 personnel) had not sought help but were interested in receiving support for a significant stressful, emotional or family problem. Of these 43.5% (n=20) screened positive for any mental health problem.

Table 24. Non-deployed Help-seeking Study - Mental Health and Help-seeking

Mental Health Outcome	n (%)	Help Source			
		None n (%)	Medical n (%)	Non-Medical n (%)	Unspecified n (%)
PTSD (3Sx) Non-Case	388 (87.6)	263 (67.8)	32 (8.2)	66 (17.0)	27 (7.0)
PTSD (3Sx) Case	55 (12.4)	18 (32.7)	7 (12.7)	21 (38.2)	9 (16.4)
CMD Non-Case	333 (74.8)	233 (70.0)	21 (6.3)	56 (16.8)	23 (6.9)
CMD Case	112 (25.2)	48 (42.9)	18 (16.1)	33 (29.5)	13 (11.6)
Alcohol Non-Case	288 (65.0)	172 (59.7)	27 (9.4)	60 (20.8)	29 (10.1)
Alcohol Case	155 (35.0)	109 (70.3)	12 (7.7)	27 (17.4)	7 (4.5)

Irrespective of mental health and alcohol status, 36.9% (n=164) of the sample (n=445) were help-seekers. Of these, 20.0% (n=89) had sought help from non-medical sources; 8.8% (n=39) from military medical sources alone or in combination with non-medical sources and 8.1% (n=36) had sought help from an unspecified source. Respondents reported that they would prefer to receive help from friends and family followed by a mental health professional; the least preferred help source was the unit chain of command or an online therapist. Preferred help sources were ranked in a similar pattern to actual sources of help with the exception of the unit chain of command, which constituted the second commonest source of actual support while being one of the least preferred sources (Table 25). 49.3% (n=219 of 444) of respondents reported having had contact with other people who were suffering from a mental health condition.

Table 25. Non-deployed Help-seeking Study - Sources of Mental Health Support

Actual Rank	Preferred Rank	*Actual Help Source n=164	n (%)	*Preferred Help Source n=448	n (%)
1	1	Friend or Family	79 (48.2)	Friend or Family	368 (82.1)
2	8	Unit Chain of Command	29 (17.7)	Mental Health Professional	314 (70.1)
3	2	Mental Health Professional	26 (15.9)	RMO or GP	274 (61.2)
4	4	Colleague	19 (11.6)	Colleague	265 (59.2)
5	3	Regimental Medical Officer or Doctor	14 (8.6)	Other Medical Staff	265 (59.2)
6	7	TRiM Practitioner	5 (3.1)	Chaplain	256 (57.1)
7	5	Other Medical Staff	5 (3.1)	TRiM Practitioner	222 (49.6)
8	6	Chaplain	3 (1.8)	Unit Chain of Command	195 (45.8)
9	9	Big White Wall Therapist Support	2 (1.2)	Big White Wall Therapist Support	194 (43.3)

*Some personnel sought help from or specified more than one source

Stigmatisation, Barriers to Care, Potential Discrimination and Personal Role in Mental Health Management

Approximately three quarters of respondents endorsed three or more of the eleven items on the stigma/BTC scale. The most frequently reported items were; 'unit leaders might treat me differently' and 'unit members might have less confidence in me' (both self-stigma). A minority of personnel felt that 'I would be blamed by my leaders' (self-stigma), that 'help is not available' (BTC), that 'I do not know where to access support' (BTC) and that 'I would think less of a colleague if they knew that they were receiving mental health care' (public stigma). Overall, stigmatising beliefs related to the self were more commonly reported than both stigma related to others and perceived BTC.

Of the RIBS items; two thirds of respondents reported that they would continue a relationship with a friend who had a mental health problem; around half would live nearby and work with someone who they knew had a mental health problem. Around one third would be prepared to live with someone with a mental health problem.

Overall, the majority of respondents viewed mental health support as helpful and that help-seeking for a mental health problem required courage or strength. Around a quarter of personnel felt that mental health problems tend to work themselves out without help. Of those who screened positive for a mental health problem, over 90% felt that mental health treatment was helpful and around 80% felt that help-seeking required courage or strength (Table 26).

Table 26. Non-deployed Help-seeking Study - Mental Health, Stigmatisation and Personal Responsibility for Mental Health Care

Rank	*Stigma/ BTC Type	Stigma/BTC Item (n)	Strongly Agree or Agree n (%)
1	Int	My unit leaders might treat me differently (463)	313 (67.6)
2	Int	Members of my unit might have less confidence in me (463)	312 (67.4)
3	BTC	The military supports Service members who have mental health problems (454)	301 (66.6)
4	Int	It would harm my career (463)	253 (54.6)
5	Int	I would be seen as weak (by those who are important to me) (464)	239 (51.5)
6	Int	It would be too embarrassing (465)	152 (32.7)
7	Ext	People with mental illness should not be given any responsibility (469)	143 (30.5)
8	Int	My leaders would blame me for the problem (463)	117 (25.3)
9	BTC	I don't know where to get help (468)	115 (24.6)
10	Ext	I would think less of a colleague if I knew they were receiving mental health treatment (464)	79 (17.0)
11	BTC	Mental health services aren't available (462)	61 (13.2)
Rank		**Intended Discriminatory Behaviour Towards People With Mental Health Problems (n). In the Future I Would:**	
1		Continue a relationship with a friend who developed a MH problem (443)	292 (65.9)
2		Live nearby to someone with a MH problem (444)	229 (51.6)
3		Work with someone with a MH problem (445)	222 (49.9)
4		Live with someone with a MH problem (441)	161 (36.5)
Rank		**Views of Personal Responsibility for Mental Health Management (n)**	
1		Mental health support can be helpful for those who need it (455)	396 (87.0)
2		It takes courage or strength to get treatment for a psychological problem (453)	366 (80.8)
3		I would prefer to manage my problems on my own (455)	280 (61.5)
4		Strong people can resolve psychological problems by themselves (455)	205 (45.1)
5		Psychological problems tend to work themselves out without help (458)	122 (26.6)

* Int= Internal/ self-stigma related to the self, Ext= External/public stigma related to others, BTC=Perceived barriers to Care

Stigmatising Beliefs, Discrimination, Mental Health and Alcohol Use

In logistic regression analyses, compared to military personnel who reported no mental health or alcohol problems, personnel reporting symptoms of CMD had a significantly increased odds of reporting nine of the eleven items constituting the stigmatisation and barriers to care scale. The largest explanatory effects were associated with the beliefs that unit leaders might treat a person differently if mental health support were sought (Wald Test F = 19.79

$p<0.001$), members of the unit having less confidence in the person (Wald Test F = 16.84 $p<0.001$) and leaders blaming the person for having the mental health problem (Wald F = 21.72 $p<0.001$). Among probable CMD cases, compared to mentally healthy personnel, there was a marginal but significant reduced odds ratio associated with reporting the belief that other people with mental illness should not be given any responsibility. Personnel reporting caseness levels of probable PTSD symptoms had significantly increased odds of reporting eight of the eleven stigma/BTC scale items, the exceptions being the belief that other people with mental illness should not be given any responsibility, that the military does not support personnel with mental health problems and that mental health services were not available. The two most substantial beliefs were similar to those found among CMD cases. These were, that unit leaders might treat a person differently if mental health support were sought (Wald Test F = 9.48 $p<0.01$) and that members of the might have less confidence in the person (Wald Test F = 9.69 $p<0.01$). The third most substantial stigma/BTC item for PTSD cases was that seeking help would be too embarrassing (Wald Test F = 16.10 $p<0.001$). The only stigma item significantly associated with reporting alcohol use potentially harmful to health was a more frequently reported belief that it would be too embarrassing to seek help for a mental health problem (Table 27).

For the additional stigma scale items related to perceived personal role in managing mental health problems, only one item was associated with reporting probable PTSD and probable CMD symptoms. Compared to symptom-free personnel those with probable PTSD and CMD symptoms had significantly increased odds of endorsing the belief that strong people can resolve psychological problems by themselves. Those reporting alcohol use levels potentially harmful to health had significantly increased odds of reporting that psychological problems tend to work themselves out without help (Table 27).

For intended discriminatory beliefs, compared to those reporting no mental health symptoms or harmful alcohol use, those with higher levels of alcohol use reported significantly greater levels of willingness to continue a relationship with a friend who had developed a mental health problem and to work with someone with a mental health problem. Neither probable PTSD nor CMD were significantly associated with this RIBS item (Table 27).

Table 27. Non-deployed Help-seeking Study -Stigmatisation Items Stratified by Mental Health Status

Stigmatising Beliefs About Mental Healthcare. *When considering seeking help for a stressful, emotional, mental health or family problem, rate each of the possible concerns that might affect <u>YOUR</u> decision to receive help.*	**Stigma Item Endorsed by Mental Health Status**							
	***No MH % (n)**	****AOR (95% CI)**	**CMD % (n)**	****AOR (95% CI)**	**PTSD % (n)**	****AOR (95% CI)**	**E2OH % (n)**	****AOR (95% CI)**
Standard Stigma Scale Items								
My unit leaders might treat me differently	62.0 (129)	1	87.7 (100)	**4.20 (2.32-7.91)**	84.7 (94)	**4.05 (1.66-9.86)**	64.6 (106)	0.92 (0.59-1.44)
Members of my unit might have less confidence in me	61.8 (128)	1	86.0 (98)	**3.54 (1.94-6.48)**	83.8 (93)	**4.12 (1.69-10.01)**	67.1 (110)	1.17 (0.74-1.84)
The military supports Service members who have mental health problems	70.6 (144)	1	57.1 (64)	**0.60 (0.37-0.96)**	58.8 (30)	0.75 (0.40-1.41)	67.7 (109)	1.06 (0.68-1.66)
It would harm my career	48.1 (100)	1	72.3 (81)	**2.26 (1.39-3.68)**	72.1 (80)	**2.77 (1.39-5.52)**	55.2 (91)	1.24 (0.81-1.89)
I would be seen as weak (by those who are important to me)	42.8 (89)	1	71.1 (81)	**2.85 (1.83-4.85)**	70.3 (78)	**3.04 (1.55-5.94)**	53.9 (89)	1.29 (0.85-1.97)
It would be too embarrassing	23.9 (50)	1	52.2 (59)	**3.08 (1.92-4.94)**	53.2 (58)	**3.54 (1.91-6.57)**	41.0 (68)	**1.85 (1.19-2.89)**
People with mental illness should not be given any responsibility	35.4 (74)	1	23.5 (27)	**0.58 (0.34-0.99)**	30.4 (34)	0.62 (0.31-1.25)	26.8 (45)	0.70 (0.44-1.12)
My leaders would blame me for the problem	19.7 (41)	1	43.4 (49)	**3.23 (1.97-5.30)**	41.8 (46)	**2.42 (1.30-4.50)**	26.7 (44)	1.34 (0.82-2.17)
I don't know where to get help	19.6 (41)	1	34.2 (39)	**1.97 (1.22-3.20)**	30.9 (17)	**1.85 (0.97-3.55)**	26.2 (44)	1.21 (0.75-1.95)
I would think less of a colleague if I knew they were receiving mental health treatment	13.4 (28)	1	25.2 (29)	**1.99 (1.14-3.48)**	26.1 (29)	**2.49 (1.27-4.90)**	14.6 (24)	0.87 (0.49-1.53)
Mental health services aren't available	12.1 (25)	1	17.7 (20)	1.63 (0.89-2.97)	13.0 (7)	1.05 (0.45-2.50)	13.9 (23)	1.40 (0.76-2.58)
Stigma Scale – Additional Items								
Mental health support can be helpful for those who need it	85.3 (174)	1	91.0 (101)	1.49 (0.69-3.24)	92.7 (102)	1.52 (0.51-4.47)	87.3 (144)	1.15 (0.60-2.21)
It takes courage or strength to get treatment for a psychological problem	79.5 (163)	1	81.8 (90)	1.01 (0.55-1.83)	85.3 (93)	1.35 (0.58-3.18)	80.4 (131)	0.90 (0.52-1.55)
I would prefer to manage my problems on my own	55.3 (114)	1	68.2 (70)	1.59 (0.97-2.61)	67.9 (74)	1.74 (0.90-3.38)	68.3 (112)	1.54 (0.99-2.40)
Strong people can resolve psychological problems by themselves	41.3 (85)	1	50.9 (56)	**1.68 (1.06-2.66)**	55.0 (60)	**2.63 (1.40-4.92)**	50.0 (82)	1.37 (0.90-2.09)
Psychological problems tend to work themselves out without help	23.6 (49)	1	26.1 (29)	1.20 (0.71-2.02)	33.3 (111)	1.80 (0.95-3.43)	34.8 (57)	**1.91 (1.20-3.06)**
****Intended Discriminatory Behaviour Towards People With Mental Health Problems (RIBS). 'In the Future I Would':**								
Continue a relationship with a friend who developed a MH problem	91.1 (123)	1	91.2 (73)	0.88 (0.31-2.47)	90.5 (67)	0.64 (0.19-2.13)	95.8 (114)	**3.74 (1.03-13.64)**
Live nearby to someone with a MH problem	87.8 (101)	1	85.5 (59)	1.03 (0.42-2.50)	78.5 (51)	0.41 (0.15-1.14)	89.4 (84)	1.55 (0.68-3.87)
Work with someone with a MH problem	81.8 (99)	1	81.0 (51)	0.74 (0.31-2.47)	77.0 (47)	0.59 (0.20-1.77)	90.7 (88)	**2.59 (1.04-6.41)**
Live with someone with a MH problem	74.5 (73)	1	68.7 (46)	0.78 (0.40-1.54)	68.4 (39)	0.36 (0.27-1.61)	70.7 (53)	0.81 (0.41-1.62)

* Personnel who reported neither GHQ-12 Score ≥4, PC-PTSD Score ≥3 nor AUDIT-C Score ≥8
** Neither Agree nor Disagree Scores recoded to 'missing' so that agreement and disagreement proportions could be directly compared.
***Adjusted Odds Ratio (AOR) - Adjusted for Rank, Age, Service Length, Sex, Relationship Status and Deployment in the Last Year

Overall, the adjusted odds of reporting greater levels of Stigma/BTC were no higher amongst those who had sought help for an emotional, family or stressful problem than those who had not (36.0%, n=58 vs. 29.2%, n=79, AOR 1.21, 95% CI 0.78-1.89). When the sample was stratified by class of help, personnel who sought help from military medical sources were no more likely to report high levels of stigma than those who had not sought help at all. However, those seeking help from non-medical sources had significantly increased odds of reporting stigma compared to non-help-seekers, an effect that remained significant after adjusting for a range of socio demographic factors and deployment in the last year. When the sample was stratified by interest in receiving help, those interested in receiving help or who were already help-seeking had significantly increased odds of reporting Stigma/BTC compared to non-help-seekers and those who were not interested in receiving help. The greatest adjusted odds of reporting stigma/BTC (Wald test F=15.44 $p<0.001$) were found amongst those who were interested in receiving help but had not yet sought it.

The adjusted odds of reporting higher levels of stigma/BTC were greater in those who had experienced contact with another person with a mental health problem. Viewing mental health management as requiring higher levels of personal responsibility was also associated with significantly increased odds of reporting stigmatising beliefs. Those who expressed the highest levels of potentially discriminatory views about people with mental health problems also reported significantly higher levels of Stigma/BTC than those reporting moderate and lower levels.

When the sample was stratified by mental health status, the odds of reporting stigmatising beliefs were significantly higher in those reporting symptoms of either CMD and or PTSD but not amongst those drinking alcohol at potentially harmful levels. Personnel who screened

positive for a mental health condition but had not sought help had the greatest adjusted odds of reporting stigma/BTC compared to the reference group (Wald test F=18.28 $p<0.001$). Compared to non-help-seekers who screened negative for mental ill-health, significantly higher rates of stigma/BTC were found amongst help-seekers who screened positive for mental health problems (Wald test F=8.85 $p<0.01$) (Table 28). There was a statistically significant trend for growing levels of stigma to be reported from the lowest levels amongst non-help-seekers who screened negative for mental health problems, through moderate levels among negative screening help-seekers to positive screening help-seekers with the highest levels found amongst positive screening non-help-seekers (χ^2 Test for Trend =25.23, $p<0.0001$).

Table 28. Non-deployed Help-seeking Study - Stigmatisation Level, Help-Seeking and Mental Health

	*Lesser Stigma n (%)	**Greater Stigma n (%)	OR (95% CI)	***AOR
Help Seeking n (%)				
Not Seeking Help 271 (68.3)	192 (70.8)	79 (29.2)	1	1
Seeking Help Medical Sources 39 (9.8)	28 (71.8)	11 (28.2)	0.96 (0.45-2.01)	0.98 (0.45-2.13)
Seeking Help Non-Medical Sources 87 (21.9)	47 (54.0)	40 (46.0)	**2.07 (1.26-3.40)**	**1.74 (1.01-3.00)**
Interest in Help Seeking n (%)				
Not Interested in Help, No Help Sought 240 (53.8)	186 (77.5)	54 (22.5)	1	1
Interested or Help Seeking 161 (36.1)	103 (64.0)	58 (36.0)	**1.94 (1.25-3.02)**	**1.74 (1.08-2.80)**
Interested, No Help Sought 45 (10.1)	21 (46.7)	24 (53.3)	**3.94 (2.04-7.61)**	**4.10 (2.03-8.30)**
Contact With Mental Health Problems in Other People n (%)				
No Contact 212 (49.8)	159 (75.0)	53 (25.0)	1	1
Contact 214 (50.2)	134 (62.6)	80 (37.4)	**1.79 (1.18-2.72)**	**1.73 (1.11-2.72)**
Resolving Mental Health Problems Requires Personal Responsibility n (%)				
Requires Less Personal Responsibility 159 (34.9)	126 (79.2)	33 (20.8)	1	1
Requires More Personal Responsibility 296 (65.1)	186 (62.8)	110 (37.2)	**2.26 (1.44-3.54)**	**2.27 (1.41-3.65)**
Discrimination Against Others With Mental Health Problems n (%)				
Lesser Discrimination 115 (26.4)	90 (78.3)	25 (21.7)	1	1
Moderate Discrimination 170 (39.0)	121 (71.2)	49 (28.8)	1.46 (0.84-2.54)	1.47 (0.81-2.66)
Greater Discrimination 151 (34.6)	90 (59.6)	61 (40.4)	**2.44 (1.41-4.23)**	**2.66 (1.47-4.82)**
Mental Health Outcomes n (%)				
No Mental Health Disorder 328 (70.8)	249 (75.9)	79 (24.1)	1	1
CMD and or PTSD 135 (29.2)	69 (51.1)	66 (48.9)	**3.02 (1.98-4.60)**	**3.07 (1.95-4.84)**
Alcohol Outcomes n (%)				
No Hazardous Alcohol Use 295 (64.1)	204 (69.2)	91 (30.8)	1	1
Hazardous Alcohol Use 165 (35.9)	113 (68.5)	52 (31.5)	1.03 (0.68-1.56)	1.08 (0.68-1.70)
Screening for Mental Health Problems (CMD and or PTSD) and Help-Seeking n (%)				
Screened Negative No Help Seeking 215 (49.8)	166 (77.2)	49 (22.8)	1	1
Screened Negative Help Seeking 87 (20.1)	62 (71.3)	25 (28.7)	1.37 (0.79-2.40)	1.25 (0.68-2.29)
Screened Positive Help Seeking 74 (17.1)	41 (55.4)	33 (44.6)	**2.73 (1.56-4.77)**	**2.49 (1.36-4.53)**
Screened Positive Not Help Seeking 56 (13.0)	26 (46.4)	30 (53.6)	**3.91 (2.12-7.23)**	**4.22 (2.18-8.17)**

*Middle and Lower Tertile of Stigma Scale Total Score
**Upper Tertile of Stigma Scale Total Score
***AOR - Adjusted for Rank (Junior, Senior and Officer), Grouped Age, Grouped Service Length, Sex, In a Relationship or Not and Deployed in the Last Year

Main Findings

The association of help-seeking, potential stigmatising beliefs about seeking support, perceived barriers to care, mental health-related discrimination and mental health problems was investigated in a randomly chosen sample of non-deployed British Army personnel. This represented the preparatory phase of the deployment cycle; there were a number of key findings. Compared to other contemporary UK military surveys, the levels of mental health symptoms and alcohol use found in this study were substantial. The study results suggested that around a third of those surveyed reported levels of alcohol use that were potentially harmful to health; approximately one quarter of personnel screened positive for probable mental disorder, reporting either symptoms of PTSD or common mental disorder. For help-seeking outcomes, of those who screened positive for probable mental health disorder, around 40.0% had not sought any form of help or support despite the widely held view among the study participants that mental health support was helpful or necessary for mentally ill people and that the act of help-seeking required courage or strength. Levels of help-seeking were substantially lower amongst probable harmful alcohol users than potential CMD or PTSD cases; around three quarters of those who screened positive for alcohol misuse had not sought any form of help. The hypothesis tested in this study was that levels of help-seeking in a non-deployed setting, in this case a UK-based garrison, would be similar among military personnel reporting higher levels of stigma/BTC versus those who report lower levels. The null hypothesis was rejected; for stigmatisation outcomes, high levels of Stigma/BTC were reported by three quarters of all respondents though overall, Stigma/BTC was no higher in help-seekers than non-help-seekers. However, when the sample was stratified by mental health caseness, the presence of mental health symptoms appeared to act together with help-seeking to affect stigma levels. Raised levels of stigma/BTC were significantly associated

with greater potential intended discrimination and having had contact with mental health condition sufferers.

CHAPTER 8 - SECONDARY PREVENTION - MENTAL HEALTH, HELP-SEEKING AND THE EFFECT OF STIGMATISATION AND BARRIERS TO CARE AMONG BRITISH MILITARY PERSONNEL FOLLOWING DEPLOYMENT

Overview

A complex relationship exists between mental health symptoms, stigmatising beliefs about mental health and help seeking. Detailed information about how these factors interact is scarce. In order to examine mental health secondary prevention activity as it relates to the immediate post-deployment period, a detailed assessment of potential barriers to help-seeking were examined among 1636 members of the UK Armed Forces who provided study data immediately after deployment (T1) and again approximately six months later (T2). Stigmatising beliefs about mental health, help-seeking and perceived barriers to care (stigma/BTC) were assessed using an eight item scale previously used in studies of UK military personnel. Symptoms of probable common mental disorder (CMD), probable post-traumatic stress disorder (PTSD) and subjective stressful, emotional, relationship and family problems were evaluated at T1 and T2. Help-seeking behaviour whilst deployed was assessed at T1 and post-deployment help-seeking at T2. Alcohol use and subjective alcohol problems were assessed at T2 only.

Reporting caseness on the mental health measures and re-instating potentially harmful alcohol use during the post-deployment period were both significantly associated with higher levels of stigma/BTC. Prevailing levels of stigma/BTC corresponded to changes in mental health status observed over the period of follow-up. Compared to those who were never a

probable mental health disorder case, recovered cases experienced significantly lower levels of stigma/BTC, whereas new onset mental health disorder cases reported significantly higher levels. Stigma/BTC levels did not appear to be static; rather, they fluctuated in proportion to current levels of psychological symptoms. Secondary prevention interventions related to mental health often use public health stigma reduction strategies which seek to promote engagement with mental health services through education. If such approaches are undertaken, they should be made relevant to those experiencing worsening mental health, whereas those who have recovered from a mental-ill-health episode may be able to assist in the delivery of such a strategy.

Introduction

As noted in the previous chapter, substantial numbers of military personnel who have mental disorders neither seek nor receive care, this applies to their civilian counterparts in equal measure (Wang et al., 2011) even when experiencing high levels of psychopathology (Oliver et al., 2005). Osorio et al., 2012, demonstrated that during deployment, stigma/BTC were substantially higher during deployment with a marked reduction immediately post-deployment. The previous chapter suggested a substantial relationship between stigma/BTC and reduced help-seeking. This chapter therefore explores in detail the relationship between stigma/BTC, mental health and help-seeking as personnel decouple from deployment and return to steady-state military life. The current study had four aims. In order to examine potential obstructions to implementing the detection component of mental health secondary prevention following deployment, this study sought to:

1. Examine the relationship between symptoms of PTSD, common mental disorder (CMD) and stigma/BTC.

2. To assess whether changes in caseness on mental health measures bring about corresponding fluctuations in levels of stigma/BTC.

3. To understand how prevailing Stigma/BTC levels, current caseness on mental health measures and recognition of the presence of psychosocial problems interact to affect help-seeking; acknowledging the presence psychosocial problems was conceptualised as being a potential marker of the ability to recognise potential mental health problems in oneself.

4. To make recommendations about how best to deliver a mental health secondary prevention strategy in the form of a stigma/BTC reduction intervention.

Study Specific Methods

Sample

The sample for this study was comprised of members of the UK Armed Forces (UK AF) (the Royal Navy including the Royal Marines, British Army and Royal Air Force) attending post-deployment decompression in Cyprus (Jones et al., 2011) after having deployed to Afghanistan in 2008/2009. Participants were volunteers who had agreed to take part in a cluster randomised controlled trial (RCT) of a novel mental health training package (called UK Battlemind) which was designed to facilitate post-deployment readjustment (Mulligan et al., 2012). This study received approval from the U.K.'s Ministry of Defence Research

Ethics Committee and the King's College Hospital Research Ethics Committee. All participants gave written informed consent. Participants completed a pre-intervention survey whilst relaxing in a non-deployed military location approximately 24 hours after leaving Afghanistan and then again some four to six months later. In addition to post-intervention outcome measures, at both time points, the surveys included a number of questions about stigmatising beliefs and barriers to care related to mental health, scales evaluating current mental health symptoms and levels of help-seeking; alcohol use was assessed at follow-up only as alcohol was prohibited during the six month deployment and, with the exception of the R&R period, personnel were effectively 'dry' during their time on operations.

Measures

Stigma/BTC were assessed using an abbreviated eight item stigma/BTC scale adapted from a 13 item measure developed in US military research (Hoge et al., 2004). This scale has previously been used in various forms to assess stigma/BTC among UK military personnel (Osorio et al 2012). In order to ensure that the stigma/BTC scale was relevant to the study sample and to ensure that a potentially bulky questionnaire was kept as brief as possible, some modifications were undertaken. Six items were retained from the original scale relating to public stigma, which included being treated differently, being seen as weak; barriers to care such as possible career harm, difficulty getting time off, not knowing where to get help and self-stigma related to potential embarrassment associated with help-seeking. The adaptation included the deletion of three US-salient items that were assessed as having low relevance to UK military samples; these were cost of care, arranging transport and scheduling appointments. The study team considered this to be appropriate, as in the UK military, logistical support such as transport is provided for, appointments are available on demand and care is free. Four further items were deleted by the Battlemind study group as they were

endorsed at lower levels in deployment surveys previously conducted by the research team; these were, mistrust of mental health practitioners, perceptions that mental health treatment does not work, loss of trust if a mental health condition were to be declared and being blamed for having a mental health problem. Two additional items were added into the scale which comprised concerns about confidentiality (BTC) and thinking less of colleagues (public stigma), both of which have been used to assess military samples (Sipos et al., 2012; Kim et al., 2012). The researchers who carried out the modifications to the scale in preparation for the RCT reported that the adjusted questionnaire retained high internal consistency (Chronbach's alpha=0.88 at baseline and 0.87 at follow up). Respondents were asked to rate their strength of agreement with each stigma or BTC item using a five-point Likert scale. The response options were disagree and strongly disagree (scoring 1 and 2 respectively) neither agree nor disagree (scoring 3), agree and strongly agree (scoring 4 and 5 respectively), which yielded scores ranging from 8–40 where higher scores indicated greater levels of stigma/BTC. The stigma/BTC scale was then summed and tertiles were generated; lower and middle tertiles were combined to compare lower levels of stigma/BTC with the highest. To assess change over the post-deployment period, stigma/BTC change scores were generated by subtracting T2 scores from T1 scores. These were computed as tertiles so that larger increases in Stigma/BTC could be compared with little or no change and larger decreases. To assess endorsement or non-endorsement of each stigma/BTC scale item, a binary variable was generated where agree and strongly agree responses were combined as were disagree and strongly disagree responses, while neutral responses that could not be allocated to an agreement category were deleted; a count variable was then generated.

Mental health outcome measures included symptoms of common mental disorder (CMD) which were assessed using the 12 item General Health Questionnaire (GHQ-12) (Goldberg et

al., 1997); endorsing four or more symptoms indicated CMD caseness on this measure (Goldberg and Williams, 1988). Probable post-traumatic stress disorder (PTSD) was assessed with the 17-item National Centre for PTSD Checklist for DSM IV (PCL-C) (Weathers et al ., 1994) using a cut off score of 50 or more to indicate probable PTSD caseness. A variable representing any mental health problem was generated by combining probable PTSD or CMD caseness; this was carried out to assess the association of stigma/BTC and other variables with general mental ill-health. Personnel were categorised according to changes in caseness status on the mental health measures from T1 to T2. The categories were: 1. never a mental disorder case, 2. recovered case, 3. persistent case and 4. new case. Current alcohol use was assessed using the 10 item Alcohol Use Disorders Identification Test (AUDIT), a validated screening tool used to identify potential alcohol use disorders (Babor et al., 2001). Given the high prevalence of alcohol use disorders in the UK AF (Fear et al., 2007), a higher cut off score of ≥16 rather than ≥8 was used to indicate the presence of alcohol use potentially harmful to health. This cut-off point has been used in previous UK military studies. Alcohol use was assessed at follow-up only as it is prohibited during deployment and other than during a short period of rest and recuperation, all personnel had not consumed alcohol in the six months prior to first assessment.

At T1, a single question asked about whether personnel had experienced a stressful, emotional, relationship or family problem while deployed and whether they had sought help for such problems while deployed. This was termed a 'subjective psychosocial problem'. The response options were; 'I experienced a problem', 'I experienced a problem but I did not seek help' and 'No, I didn't experience a problem'. At T2, additional questions included; 'Since returning from [deployment] have you had a stressful/emotional or a relationship/family problem?' For the purpose of analyses, stressful/emotional and

family/relationship problems were conflated into a single variable to signify subjective psychosocial problems. The same question stem was used to assess subjective alcohol problems; 'Since returning from [deployment] have you had alcohol problems?'

Participants were categorised according to whether they reported subjective psychosocial problems and whether they also reported mental health measure caseness using the combined PTSD or CMD measures. This produced four categories:

1. No subjective psychosocial problems, not a case on the mental health measures.
2. Subjective psychosocial problems, not a case on the mental health measures.
3. No subjective psychosocial problems, a case on the mental health measures.
4. Subjective psychosocial problems, a case on the mental health measures.

The same process of categorisation was applied to subjective alcohol problems and potentially harmful alcohol use measured using the AUDIT-10:

1a. No perceived alcohol use problems, no harmful alcohol use.
2a. Perceived alcohol use problems, no harmful alcohol use.
3a. No perceived alcohol use problems, harmful alcohol use.
4a. Perceived alcohol use problems, harmful alcohol use.

Further questions were asked about help seeking behaviours occurring during the post-deployment period. In addition to asking if help had been sought, participants were asked to select help-sources from a list which included medical sources such as doctors and mental health practitioners, and non-medical sources such as welfare officers, friends, family and

Trauma Risk Management (TRiM) Practitioners. The latter are military peers who have received specific training to deliver post-traumatic exposure mental health support (Greenberg et al., 2011). Subjects were categorised according to whether they were experiencing symptoms of mental disorder and whether they were help-seeking. This produced four categories:

1b. Not a case on the mental health measures, not help seeking.

2b. Not a case on the mental health measures, help seeking.

3b. Mental disorder symptoms, help seeking.

4b. Mental disorder symptoms, not help seeking.

Finally, participants were asked whether they were interested in receiving help or support.

Analyses

All analyses were conducted in the Statistical Package for Social Sciences version 20. Categorical data were initially explored to identify significant associations using Pearson's chi squared test. The effect of a range of independent variables, including mental health caseness, perceived psychosocial problems and help-seeking upon the dependent variables, represented by higher or lower levels of stigma and individual stigma/BTC scale items, was assessed using univariable and multivariable logistic regression to generate odds ratios (OR) with 95% confidence intervals (CI). ORs and 95% CIs were adjusted for a range of observed confounding variables including socio-demographic factors; age, regular or reserve forces status, Service background, combat role, sex, rank, service length and individual augmentee (IA) status; IAs are those personnel who deploy alone or with small numbers of other military

personnel rather than formed unit personnel who deploy with known members of their peacetime unit. Operational factors included previous episodes of operational deployment, levels of combat exposure and perceived better or poorer leadership at T1. These analyses were repeated using a binary dependent variable comprised of increased stigma/BTC versus decreased Stigma/BTC in combination with minimal or no change at follow-up; for this evaluation, changes in mental health caseness during the follow-up period constituted the independent variable. Numbers and percentages of those who returned a valid answer are reported in this study, whereas missing data are not; percentages and numbers may not sum to sample and sub-sample totals. Statistical significance was $p \leq 0.05$.

Exclusions

From a total of 2510 responders at T1, 1636 personnel supplied both initial and follow-up data. Psychological symptoms and stigma levels were compared between non-responders and responders at follow-up and there were no statistical differences between the two groups in the baseline (T1) rates of probable PTSD (2.9%, n=25 vs. 2.3%, n=37, χ^2=0.93 d.f.1, p=0.34), CMD (14.9%, n=129 vs. 15.5%, n=251, χ^2=0.13 d.f.1, p=0.72) and reporting ≤3 stigma/BTC scale items (21.5%, n=172 vs. 22.7% n=345, χ^2=0.39 d.f.1, p=0.53). It was therefore concluded that baseline (T1) stigma/BTC levels and mental health status did not influence non-response at T2 and that the T1 responses of non-responders at T2 could be dropped from analyses without substantially biasing outcomes. Non-responders (n=874) were excluded from further analyses so that a direct comparison of those who supplied baseline and follow-up data could be undertaken (n=1636).

Theoretically, the type of intervention delivered in the RCT could have had a modifying effect upon stigma/BTC levels. To test whether this had occurred, adjusted logistic

regression analyses were conducted using the type of briefing intervention that the two samples were randomised to receive in the trial as the predictor and reporting ≤3 stigma/BTC items as the dependant variable. Potential confounders were adjusted for, including, Service background, serving in a combat role, age, being in the reserve or regular forces, relationship status, IA status, number of previous deployments, levels of combat exposure and perceptions of leadership. There were no significant differences in stigma/BTC levels between the randomised groups at baseline (AOR 0.93, 95% CI 0.70-1.22) and briefing intervention type had no significant effect upon stigma/BTC levels at follow-up (AOR 0.85, 95% C I 0.66-1.09).

Results

Sample Characteristics

The socio-demographic, military and operational characteristics of respondents were compared with whole force data where this was available (Defence Statistics, 2014) and found to be unrepresentative in several respects. Certain groups were over-represented in the study sample including Royal Marines, males and combat personnel; under-represented groups included Royal Air Force personnel, those under 25 years of age and reserve forces. The rank structure of the sample was, however, similar to that of the whole UK AF. Despite the potential for sampling bias, stigma scores falling above the upper tertile were not significantly different within the various socio-demographic and operational sub-categories (Table 29).

Mental Health Outcomes, Alcohol Use and Stigma/BTC

At T1, 2.3% of personnel (n=37) scored positive for probable PTSD caseness compared to 3.9% (n=63) at T2 ($p<0.01$); 15.5% (n=251) of personnel had symptoms of probable CMD at T1 compared to 14.1% (n=228) at T2 ($p=0.27$). 22.7% of personnel (n=345) endorsed ≥3 Stigma/BTC components at T1 compared to 30.0% (n=462) at T2 ($p<0.0001$). At follow-up, 19.9% (n=317) of personnel were drinking alcohol at levels likely to be harmful to health (Table 30).

Personnel reporting caseness levels of either CMD or PTSD had significantly greater adjusted odds of reporting stigma/BTC than personnel with fewer symptoms both at T1 (58.7, n=152 vs. 29.5%, n=398) and T2 (67.3%, n=165 vs. 30.5%, n=412). Those who reported potentially harmful levels of alcohol use had significantly greater adjusted odds of reporting stigma/BTC at T2 (51.7%, n=163) than those consuming alcohol at lower levels (31.7%, n=398) (Table 32).

Table 29. Help-Seeking and Stigma Study - Socio-demographic Factors.

Socio-Demographic Factors	n (%)	*Whole Force (%)	**High Stigma n (%)	***χ^2, d.f., *p*
Service (n=1636)				
Army	955 (58.4)	55.5	325 (34.7)	χ^2=0.27 d.f.2, *p*=0.88
Royal Marines	640 (39.1)	20.3	213 (33.8)	
Royal Navy	38 (2.3)		12 (31.6)	
Royal Air Force	3 (0.2)	24.2	0 (0.0)	
Age Groups (n=1635)				
<25	645 (39.4)	28.2	204 (32.1)	χ^2=5.55 d.f.4, *p*=0.24
25-29	463 (28.3)	22.9	171 (37.7)	
30-34	227 (13.9)	16.7	83 (36.9)	
35-39	197 (12.0)	32.2	61 (31.3)	
≥40	103 (6.3)		31 (31.0)	
Service Length (n=1619)				
1-4 Years	555 (34.3)	Not Available	183 (33.3)	χ^2=6.61, d.f.4, *p*=0.16
2-4 Years	535 (33.0)		190 (35.8)	
5-12 Years	281 (17.4)		105 (37.8)	
13-21 Years	188 (11.6)		56 (30.1)	
≥ 22 Years	60 (3.7)		14 (23.7)	
Role (n=1634)				
Combat	776 (47.5)	34.0	247 (32.3)	χ^2=2.30, d.f.2, *p*=0.32
Combat Support	493 (30.2)	30.0	173 (35.7)	
Combat Service Support	365 (22.3)	36.0	130 (36.2)	
Engagement Type (n=1618)				
Regular	1552 (95.9)	90.9	524 (34.1)	χ^2=0.53, d.f.1, *p*=0.47
Reserve	66 (4.1)	9.1	25 (38.5)	
Sex (n=1636)				
Male	1606 (98.2)	90.4	540 (34.2)	χ^2=0.00, d.f.1, *p*=0.97
Female	30 (1.8)	9.6	10 (34.5)	
Relationship Status (n=1616)				
Not In a Long-Term Relationship	489 (30.3)	Not Available	158 (32.6)	χ^2=0.78, d.f.1, *p*=0.38
In a Long-Term Relationship	1127 (69.7)		387 (34.9)	
Rank (n=1634)				
Junior Rank	682 (41.7)	60.2	387 (34.6)	χ^2=0.27, d.f.2, *p*=0.88
Junior Non-Commissioned Officer	457 (28.0)			
Senior Non-Commissioned Officer	300 (18.4)	22.7	99 (33.3)	
2nd Lieutenant to Major	188 (11.5)	14.0	64 (33.3)	
Lieutenant Colonel and Above	7 (0.4)	3.1		
Previous Deployments (last 5 Years) (n=1614)				
0 or 1	678 (42.0)	Not Available	219 (32.6)	χ^2=1.39, d.f.1, *p*=0.24
≥2	936 (58.0)		328 (35.4)	
Time Deployed (n=1582)				
Shorter (4-25 weeks)	550 (34.8)	Not Available	196 (36.4)	χ^2=3.26, d.f.2, *p*=0.20
Moderate (26-27 weeks)	544 (34.4)		167 (31.2)	
Longer (28-42 weeks)	488 (30.8)		164 (33.8)	
Individual Augmentee (IA) or Formed Unit (FU) Personnel (n=1513)				
IA	219 (14.5)	Not Available	78 (35.9)	χ^2=0.39, d.f.1, *p*=0.53
FU	1294 (85.5)		430 (33.8)	

*Where valid comparison data relating to the whole of the UK AF was available from Defence Statistics
** Personnel reporting stigma/BTC scores in the upper tertile at baseline measurement
***Test statistic is for the distribution of upper tertile stigma scores among the various sub-categories
Stigma/BTC response n's and %'s exclude missing data

Table 30. Help-Seeking and Stigma - Mental Health Outcomes at T1 and T2

	T1 Scores	T2 Scores	χ^2, d.f., *p*
Mental Health Outcome	**n (%)**	**n (%)**	
PCL-C Score <50	1589 (97.7)	1554 (96.1)	**χ^2=7.13 d.f.1, *p*<0.01**
PCL-C Score ≥50	37 (2.3)	63 (3.9)	
Endorsed <4 GHQ 12 Symptoms	1372 (84.5)	1391 (85.9)	χ^2=1.23 d.f.1, *p*=0.27
Endorsed ≥4 GHQ 12 Symptoms	251 (15.5)	228 (14.1)	
Endorsed <3 Stigma/BTC Components	1177 (77.3)	1077 (70.0)	**χ^2=21.31 d.f.1, *p*<0.0001**
Endorsed ≥3 Stigma/BTC Components	345 (22.7)	462 (30.0)	

Stigma/BTC Components and Mental Health

The association between each of the eight stigma/BTC scale components and caseness on the mental health measures was assessed at T1 and at T2. At T1, following adjustment for T1 socio-demographic characteristics, operational factors and leadership levels, there was a significantly increased odds of reporting probable combined PTSD and CMD for all stigma/BTC components. A similar pattern was seen at T2 after adjusting for T2 covariates. At T1, the two most commonly cited reasons for not seeking help were being seen as weak by other important people and being treated differently by leaders. The least frequently endorsed components were not knowing where to get help and thinking less of a help-seeking unit member. At T2, the rank order of stigma/BTC components was similar, though being seen as weak and being treated differently exchanged the top ranked position (Table 31).

Subjective Psychosocial Problems, Mental Health Outcomes and Stigma/BTC

Of 1628 personnel, 26.2% (n=427) reported that they had experienced a subjective psychosocial problem since returning from deployment and 24.6% (n=400) reported PTSD or CMD at some stage during follow-up, that is, either at T1 or T2.

Table 31. Help-Seeking and Stigma - Itemised Stigma Responses

Stigma Item		*T1 Probable Mental Health Disorder Status			T1 Stigma/BTC	*T2 Probable Mental Health Disorder Status			T2 Stigma/BTC
Type	**Stem Question:** I would be reluctant to seek help for a mental health problem because:	**No Case n (%)**	**Case n (%)**	**[1]AOR 95% CI**	**Endorsed n (%)**	**No Case n (%)**	**Case n (%)**	**[2]AOR 95% CI**	**Endorsed n (%)**
Public Stigma	I would be seen as weak (by those who are important to me)	277 (69.6)	121 (30.4)	**3.33 (2.33-4.74)**	398 (33.8)	335 (73.0)	124 (27.0)	**3.37 (2.30-4.92)**	461 (38.9)
	Not Endorsed	704 (90.4)	75 (9.6)	1		661 (92.2)	56 (7.8)	1	
Public Stigma	My unit leaders/bosses might treat me differently	275 (69.3)	122 (30.7)	**3.32 (2.31-4.77)**	397 (33.3)	392 (74.4)	135 (25.6)	**3.05 (2.08-4.46)**	531 (44.8)
	Not Endorsed	722 (90.8)	73 (9.2)	1		596 (92.0)	52 (8.0)	1	
Barrier to Care	It would harm my career	200 (71.2)	81 (28.8)	**2.33 (1.63-3.34)**	281 (23.2)	309 (73.6)	111 (26.4)	**2.83 (1.96-4.06)**	423 (35.8)
	Not Endorsed	819 (88.1)	111 (11.9)	1		688 (90.9)	69 (9.1)	1	
Self-Stigma	It would be too embarrassing	165 (66.5)	83 (33.5)	**3.85 (2.65-5.60)**	248 (22.1)	229 (69.8)	99 (30.2)	**3.43 (2.37-4.95)**	328 (28.9)
	Not Endorsed	783 (89.4)	93 (10.6)	1		727 (90.8)	74 (9.2)	1	
Public Stigma	My visit would not remain confidential	170 (66.7)	85 (33.3)	**3.95 (2.75-5.69)**	255 (20.4)	212 (70.0)	91 (30.0)	**3.97 (2.73-5.77)**	306 (24.5)
	Not Endorsed	894 (89.6)	104 (10.4)	1		855 (91.1)	84 (8.9)	1	
Barrier to Care	There would be difficulty getting time off work for treatment	153 (68.0)	72 (32.0)	**3.18 (2.19-4.63)**	225 (18.6)	205 (68.5)	95 (31.7)	**3.86 (2.67-5.58)**	301 (23.6)
	Not Endorsed	871 (88.7)	111 (11.3)	1		888 (91.6)	81 (8.4)	1	
Self-Stigma	I would think less of a team member receiving mental health treatment	92 (73.6)	33 (26.4)	**1.68 (1.06-2.68)**	125 (9.6)	95 (73.6)	34 (26.4)	**1.83 (1.14-2.93)**	130 (9.9)
	Not Endorsed	1002 (85.3)	172 (14.7)	1		1019 (86.8)	155 (13.2)	1	
Barrier to Care	I don't know where to get help	25 (61.0)	16 (39.0)	**3.53 (1.67-7.44)**	41 (3.1)	46 (57.5)	34 (42.5)	**5.10 (2.97-8.76)**	80 (6.0)
	Not Endorsed	1096 (85.6)	184 (14.4)	1		1095 (87.9)	151 (12.1)	1	

[1]AOR – Adjusted for socio-demographic factors (age, regular or reserve forces, individual augmentee vs. formed unit personnel, Service background, combat role, sex, rank, service length), operational factors (previous operational deployment, combat exposure) and perceived better or poorer leadership at T1.
[2]AOR – Adjusted for socio-demographic factors (age, regular or reserve forces, individual augmentee vs. formed unit personnel, Service background, combat role, sex, rank, service length), operational factors (previous operational deployment, combat exposure) and perceived better or poorer leadership at T2.
*Either ≥4 GHQ 12 symptom endorsements or PCL-C Scores ≥50.

Table 32. Help-Seeking and Stigma - Mental Health, Help-seeking, Alcohol Use and Subjective Mental Health

	*Lesser Stigma n (%)	**Greater Stigma n (%)	OR (95% CI)	[1]AOR	[2]AOR	[3]AOR	[4]AOR
Mental Health Outcomes at T1 n (%) (Stigma Data Gathered at T1)							
No Mental Health Measure Caseness 1350 (83.9)	952 (70.5)	398 (29.5)	1	1	1	1	1
Either CMD or PTSD 259 (16.1)	107 (41.3)	152 (58.7)	**3.40 (2.59-4.47)**	**3.53 (2.65-4.71)**	**3.43 (2.61-4.51)**	**3.08 (2.33-4.09)**	**2.87 (2.16-3.81)**
Mental Health Outcomes at T2 n (%) (Stigma Data Gathered at T2)							
No Mental Health Measure Caseness 1351 (84.6)	939 (69.5)	412 (30.5)	1	1	1	1	1
Either CMD or PTSD 245 (15.4)	80 (32.7)	165 (67.3)	**4.70 (3.51-6.29)**	**4.65 (3.42-6.31)**	**4.66 (3.47-6.24)**	**4.00 (2.95-5.42)**	**4.00 (2.91-5.54)**
Alcohol Outcomes at T2 n (%) (Stigma Data Gathered at T2)							
No Potentially Harmful Alcohol Use 1254 (79.9)	856 (68.3)	398 (31.7)	1	1	1	1	1
Potentially Harmful Alcohol Use 315 (20.1)	152 (48.3)	163 (51.7)	**2.31 (1.80-2.96)**	**2.33 (1.79-3.03)**	**2.37 (1.83-3.07)**	**2.24 (1.74-2.89)**	**2.08 (1.56-2.78)**
Subjective Psychosocial Problems and Help-Seeking During Deployment n (%) (Stigma Data Gathered at T1)							
No Problem - Did Not Seek Help 1191 (75.0)	813 (68.3)	378 (31.7)	1	1	1	1	1
Experienced a Problem and Sought Help 122 (7.7)	76 (62.3)	46 (37.7)	1.30 (0.89-1.92)	1.30 (0.87-1.95)	1.27 (0.86-1.88)	1.20 (0.80-1.78)	1.21 (0.79-1.84)
Experienced a Problem - Did Not Seek Help 276 (17.4)	159 (57.6)	117 (42.4)	**1.58 (1.21-2.07)**	**1.57 (1.18-2.07)**	**1.59 (1.22-2.09)**	**1.44 (1.09-1.91)**	**1.44 (1.09-1.93)**
Help Seeking Post Deployment – Medical and Non-Medical Sources n (%)							
No Help-Seeking 1424 (89.1)	925 (65.0)	499 (35.0)	1	1	1	1	1
Help Source Included Medical Sources 68 (4.3)	43 (65.2)	25 (36.8)	1.08 (0.65-1.79)	0.97 (0.56-1.67)	1.11 (0.67-1.85)	1.00 (0.58-1.73)	0.92 (0.51-1.67)
Sought Help Non-Medical Sources 107 (6.7)	58 (54.2)	49 (45.8)	**1.57 (1.57-2.33)**	**1.55 (1.02-2.36)**	**1.57 (1.06-2.34)**	**1.57 (1.03-2.39)**	**1.65 (1.06-2.56)**
Interest in Help Seeking Post Deployment n (%)							
Not Interested in Help, No Help Sought 1287 (84.1)	844 (65.6)	443 (34.4)	1	1	1	1	1
Interested and Already Help Seeking 173 (11.3)	101 (58.4)	72 (41.6)	1.36 (0.98-1.88)	1.30 (0.92-1.83)	**1.38 (1.00-1.91)**	1.34 (0.95-1.89)	1.35 (0.94-1.95)
Interested, No Help Sought 70 (4.6)	33 (47.1)	37 (52.9)	**2.14 (1.32-3.46)**	**2.02 (1.23-3.31)**	**2.12 (1.31-3.45)**	**1.21 (1.31-3.72)**	**2.14 (1.26-3.63)**

*Middle and Lower Tertile of Stigma Scale Total Score.
**Upper Tertile of Stigma Scale Total Score.
[1]AOR – Adjusted for Service background, combat arm, age, engagement type, relationship status, individual augmentee vs. formed unit, rank and previous deployment.
[2]AOR – Adjusted for combat exposure and previous operational deployment.
[3]AOR – Adjusted for leadership at T1 for T1 stigma/BTC and T2 for T2 stigma/BTC.
[4]AOR – Adjusted for all observed confounders.

Subjective Alcohol Problems, Alcohol Use Levels and Stigma/BTC

5.5% of personnel (n=89 of 1613) reported that they had experienced alcohol problems since returning home, however, 19.9% (n=317 of 1592) scored positive on the alcohol measure for probable harmful alcohol use.

Personnel in Category 3a and Category 4a reported significantly higher levels of stigma/BTC (52.1% for both groups, n=123 and n=38 respectively) than those in Category 1a, the reference group (31.2%, n=384). Although Category 2a personnel reported higher levels of stigma/BTC than the reference group (54.5%, n=6), there were insufficient category numbers to confidently assess the level of significance (Table 33).

Table 33. Help-Seeking and Stigma - Mental Health Outcomes, Subjective Psychosocial Problems, Alcohol Use and Stigma/BTC

Category	Mental Health Outcomes, Subjective Psychosocial Problems and Alcohol use during the T1 to T2 period	Stigma/BTC Level		OR (95% CI)	*AOR (95% CI)
		Middle and Lower n (%)	Higher n (%)		
Subjective Psychosocial Problems and Probable Mental Health Disorder Caseness n (%)					
Cat 1	No subjective psychosocial problems, **No Mental Health Measure Caseness 1133 (71.3)	811 (71.6)	322 (28.4)	1	1
Cat 2	Subjective psychosocial problems, No Mental Health Measure Caseness 61 (3.9)	40 (65.6)	21 (34.4)	1.32 (0.77-2.28)	1.07 (0.57-2.00)
Cat 3	No subjective psychosocial problems, Mental Health Measure Caseness 256 (16.1)	121 (47.3)	135 (52.7)	**2.81 (2.13-3.71)**	**2.59 (1.89-3.53)**
Cat 4	Subjective psychosocial problems, Mental Health Measure Caseness 138 (8.7)	42 (30.4)	96 (69.6)	**5.76 (3.92-8.46)**	**4.92 (3.22-7.52)**
Subjective Alcohol Problems and Probable Harmful Alcohol Use n (%)					
Cat 1a	No perceived alcohol problems, AUDIT <16 1229 (79.3)	845 (68.8)	384 (31.2)	1	1
Cat 2a	Perceived alcohol problems, AUDIT <16 11 (0.7)	5 (45.5)	6 (54.5)	2.64 (0.80-8.71)	1.87 (0.46-7.49)
Cat 3a	No perceived alcohol problems, AUDIT ≥16 236 (15.2)	113 (47.9)	123 (52.1)	**2.40 (1.81-3.18)**	**2.20 (1.59-3.02)**
Cat 4a	Perceived alcohol problems, AUDIT ≥16 73 (4.7)	35 (47.9)	38 (52.1)	**2.39 (1.49-3.84)**	**1.98 (1.16-3.38)**
Mental Health Caseness (CMD and or PTSD) and Help-Seeking Post Deployment n (%)					
Cat 1b	No Mental Health Measure Caseness, Not Help Seeking 1040 (69.8)	741 (71.2)	299 (28.8)	1	1
Cat 2b	No Mental Health Measure Caseness, Help Seeking 81 (5.4)	59 (72.8)	22 (27.2)	0.92 (0.56-1.54)	0.97 (0.56-1.70)
Cat 3b	Mental Health Measure Caseness, Help Seeking 89 (6.0)	39 (43.8)	50 (56.2)	**3.18 (2.05-4.93)**	**3.02 (1.83-4.97)**
Cat 4b	Mental Health Measure Caseness, Not Help Seeking 279 (18.7)	118 (42.3)	161 (57.7)	**3.38 (2.57-4.44)**	**3.10 (2.29-4.21)**

*AOR – Adjusted for socio-demographic factors (age, regular or reserve forces, individual augmentee vs. formed unit personnel, service background, combat role, sex, rank, service length), operational factors (previous operational deployment, combat exposure) and perceived better or poorer leadership at T2
**GHQ 12 Symptom Endorsements ≥4 and or PCL-C Scores ≥50

Mental Health Measure Caseness and Changes in Stigma/BTC

A comparison was made between, changes in either CMD or PTSD caseness and changes in stigma/BTC levels at both T1 and T2. Of the non-cases at T1 (the reference group), 33.2% (n=392) reported an increase in stigma/BTC levels at T2. Not being a case at T1 but being a case at T2, representing new caseness, was associated with significantly greater odds of reporting increased stigma/BTC at T2 (48.9%, n=66) compared to the reference group. Being a case at T1 but not at T2, representing remission, was associated with a significantly reduced odds of reporting an increase in stigma/BTC at T2 (23.0%, n=34) compared to the reference group whereas caseness at both time points, representing persistent symptoms, was associated with levels of stigma/BTC at T2 that were similar to the reference group (38.7%, n=41). The overall results were not substantially modified when adjusted for observed confounders (Table 34).

Table 34. Help-Seeking and Stigma - Mental Health Outcomes and Stigma/BTC Change Scores

Mental Health Measure Caseness (GHQ ≥4 or PCL-C ≥50) n (%)	Stigma/BTC Change Scores (T1 to T2)			*OR (95% CI)	[1]AOR (95% CI)	[2]AOR (95% CI)	[3]AOR (95% CI)	[4]AOR (95% CI)
	Decrease n (%)	Minimal or No Change n (%)	Increase n (%)					
No Caseness at T1 or T2 1181 (75.2)	403 (34.1)	386 (32.7)	392 (33.2)	1	1	1	1	1
Caseness at T1 not at T2 148 (9.4)	66 (44.6)	48 (32.4)	34 (23.0)	0.60 (0.40-0.90)	0.66 (0.44-1.00)	0.57 (0.38-0.86)	0.60 (0.40-0.90)	0.63 (0.41-0.96)
Caseness at T1 and T2 106 (6.8)	28 (26.4)	37 (34.9)	41 (38.7)	1.27 (0.84-1.91)	1.34 (0.87-2.05)	1.26 (0.83-1.90)	1.19 (0.78-1.80)	1.24 (0.80-1.93)
No Caseness at T1 Caseness at T2 135 (8.6)	33 (24.4)	36 (26.7)	66 (48.9)	1.93 (1.35-2.76)	2.04 (1.40-2.98)	1.88 (1.31-2.70)	1.76 (1.21-2.54)	1.88 (1.27-2.78)

*Dependant variable is increase in stigma/BTC at follow-up vs. decreased and minimal or no change.
[1]AOR- Adjusted for socio-demographic factors (age, regular or reserve forces, individual augmentee vs. formed unit personnel, Service background, combat role, sex, rank, service length).
[2]AOR – Adjusted for operational factors (previous operational deployment, combat exposure).
[3]AOR – Adjusted for leadership at T2.
[4]AOR – Adjusted for all observed confounders.

Help-Seeking

Subjective Psychosocial Problems and Help-Seeking During Deployment

Of 1601 personnel, 25.1% (n=401) reported that they had experienced subjective psychosocial problems during their deployment. Of those reporting such problems, 30.9% (n=124) had sought help whilst deployed from either medical or non-medical sources. Those who reported subjective psychosocial problems during deployment and who had sought help reported levels of stigma/BTC that were not significantly different to levels found among non-help-seekers who reported no such problems (37.7%, n=46 vs. 31.7%, n=378). Those who reported problems during deployment but who had not sought help had significantly greater odds of reporting raised levels of stigma/BTC (42.4%, n=117) (Table 34).

Subjective Psychosocial Problems and Help-Seeking Post-Deployment

Since returning from deployment, 47.5% (n=149) of personnel who reported that they had experienced a subjective psychosocial problem had sought help; for subjective alcohol problems the rate was 57.3% (n=51) and for family or relationship problems, the post-deployment help-seeking rate was 39.7% (n=106) (Table 37).

Mental Health Caseness, Alcohol Use and Help Seeking Post-Deployment

Since returning from deployment, 38.8% (n=33) of probable PTSD cases had sought help; for CMD caseness the rate was 25.4% (n=89) and for potentially harmful alcohol use the rate was 9.1% (n=27) (Table 37). Given the limitations of the survey approach, it was not

possible to establish whether the person had sought help for the clinical problem or was help-seeking and coincidentally scored positive on the survey measure.

Post-Deployment Help-Seeking and Source of Support

Amongst help seekers who were PTSD cases, military unit-based non-medical assistance, including the Padre and Welfare Officer, was the most frequently accessed category of support (54.6%, n=18), followed by partner, family and civilian friends (48.5%, n=16). For CMD, personnel most frequently accessed partners, family and civilian friends (67.4%, n=60) and for those scoring positive for potentially harmful alcohol use, partners, family and civilian friends were the most popular help source along with military friends or colleagues (both categories 33.3%, (n=9)). For subjective psychosocial problems and subjective alcohol problems, partner, family and civilian friends were the most frequently accessed sources of support; in all cases peer-delivered mental health support in the form of TRIM was least frequently sought out. The results are shown in Table 35 where family and relationship problems and stressful and emotional problems are shown separately for interest as there were some differential help-seeking effects.

Table 35. Help-Seeking and Stigma - Help Sources

Help Seeking	Subjective Problem Reported After Returning Home n (%)			Assessed Problem After Returning Home n (%)		
	Stressful or Emotional (n=314)	Alcohol (n=89)	Family or Relationship (n=267)	PCL Case (n=85)	CMD Case (n=350)	AUDIT≥16 (n=297)
No Help Sought	165 (52.5)	38 (42.7)	161 (60.3)	52 (61.2)	261 (74.6)	270 (90.9)
Sought Help From at Least One Source	149 (47.5)	51 (57.3)	106 (39.7)	33 (38.8)	89 (25.4)	27 (9.1)
*Reported Help Source						
Partner, Civilian Friend, Family	61 (40.9)	17 (33.3)	62 (58.5)	16 (48.5)	60 (67.4)	9 (33.3)
Military Friend or Colleague	54 (36.2)	15 (29.4)	31 (29.3)	11 (33.3)	28 (31.5)	9 (33.3)
Regimental Medical Officer or Doctor	50 (33.6)	15 (29.4)	13 (12.3)	15 (45.5)	32 (36.0)	4 (14.8)
Unit Commanders	31 (20.8)	8 (15.7)	23 (21.7)	15 (45.5)	33 (37.1)	5 (18.5)
**Other Non-Medical Staff	27 (18.1)	6 (11.8)	18 (17.0)	18 (54.6)	32 (36.0)	2 (7.4)
Mental Health Professional	37 (24.8)	6 (11.8)	7 (6.6)	15 (45.5)	27 (30.3)	5 (18.5)
***TRiM Practitioner	13 (8.7)	0 (0.0)	0 (0.0)	4 (12.1)	6 (6.7)	0 (0.0)

*Some personnel sought help from more than one source.
**Padre, unit based Welfare Officer.
***Peers trained to deliver post traumatic exposure mental health support.

Post-Deployment Mental Health, Help-seeking and Stigma/BTC

28.4% (n=322) of those in Category 1, asymptomatic personnel with no subjective psychosocial problems, which constituted the reference group, reported higher levels of stigma/BTC. Category 2 subjects, asymptomatic personnel with subjective psychosocial problems showed similar proportions of raised stigma/BTC to those found among the reference group (34.4%, n=21). Category 3 (symptomatic personnel with no subjective psychosocial problems) and Category 4 (symptomatic personnel with subjective psychosocial problems) subjects were both significantly more likely to report greater stigma/BTC than the reference group (52.7%, n=135 and 69.6%, n=96 respectively). The significant associations remained after adjusting for socio-demographic characteristics, operational factors and perceived leadership behaviours (Table 32).

Help-seekers who were not probable PTSD or CMD cases but who had sought help for subjective psychosocial problems (Category 1b) were no more likely to report higher levels of Stigma/BTC (27.2%, n=22) than the reference group who were non-help-seekers with sub-caseness mental health (28.8%, n=299) (Category 2b). Help-seekers who were mental health cases (Category 2c) reported significantly higher levels of stigma/BTC (56.2%, n=50) than the reference group and the highest levels were reported by symptomatic non-help-seekers (Category 2d) whose stigma/BTC levels were significantly higher than the reference group (57.7%, n=161) (Table 32).

Stigma/BTC and Post-Deployment Source of Help

Compared to stigma/BTC levels among post-deployment non-help-seekers (the reference group) (35.0%, n=499), those who sought help from any source (including medical staff) were not significantly more likely to report stigma/BTC (36.8%, n=25). Help-seekers accessing non-medical sources alone had a significant increased odds of reporting stigma/BTC (45.8%, n=49) (Table 32).

Help-Seeking Stigma/BTC and Interest in Receiving Help

Personnel interested in receiving help for a subjective psychosocial problem but who were yet to seek help were significantly more likely to report stigma/BTC (52.9%, n=37) than the reference group who were those not interested in and not seeking help (34.4%, n=443). Those who were both interested in receiving help and who had accessed support were not significantly more likely to report stigma/BTC (41.6%, n=72) than the reference group. The

overall results were not substantially modified when adjusted for observed confounders (Table 32).

Main Findings

The results of this study did not support the null hypothesis that symptoms of probable mental disorder would be similar among those reporting higher and lower levels of stigma/BTC at both assessment points. Personnel who were classified as cases of probable PTSD, CMD or who reported potentially harmful alcohol use in the post-deployment period had significantly higher levels of stigma/BTC than non-symptomatic personnel and non-harmful alcohol users. The secondary research question was whether levels of stigma/BTC would have any substantial effect upon rates of help-seeking. Recognising the presence of a subjective psycho-social problem was only significantly associated with raised stigma/BTC when caseness levels of mental health symptoms were present. It is therefore proposed that substantive mental health symptoms are important in determining levels of stigma/BTC whereas recognising that one has a psychosocial problem might serve to augment stigma/BTC but is not necessary for raised stigma/BTC levels. Underlining the importance of symptoms in relation to stigma/BTC, new onset mental health measure caseness and remission from caseness were both associated with increases and reductions in stigma/BTC respectively. The results suggested that, in addition to the presence of caseness levels of mental health symptoms, being interested in receiving help or support, whilst not actually seeking it, was associated with substantial levels of stigma/BTC.

CHAPTER 9 – TERTIARY PREVENTION – MENTAL HEALTHCARE IN THE DEPLOYED LOCATION

Overview

This chapter describes a study that sought to gauge the effect of tertiary preventative activities conducted during deployment. An assessment of occupational functioning was conducted among UK Service personnel who accessed mental healthcare while deployed on combat operations. Data were gathered in Afghanistan between 2006 and 2010 from 611 UK military personnel assessed by a deployed mental health team. Two outcomes were assessed; firstly, the rate of return to duty (RTD) in the operational area and secondly, longer-term occupational fitness, adverse discharges and military offending following deployment. The predictors of RTD and longer-term occupational functioning were assessed by linking deployment clinical records to personnel databases. The groups most commonly assessed by the mental health team were younger personnel, males, junior ranks and those with a combat role. After completion of care, 76.8% (n=436) returned to full duty with their operational unit; the remainder were evacuated home. After controlling for potential confounders, predictors of evacuation included having a history of mental disorder among close family members, difficulty adjusting to the operational environment, exposure to greater levels of non-combat stress and threatening to or actually carrying out self-harm whilst deployed. For longer-term occupational outcomes, 33.7% (n=149) experienced adverse occupational consequences in the four year period of assessment after returning home which, following adjustment for potential confounders, was predicted by greater levels of pre-deployment psychological vulnerability. Compared to referrals from a medical officer, there was no

evidence that initiating a self-referral or being referred by a non-medical person affected longer-term occupational outcomes. Tertiary prevention in the form of deployed mental healthcare effectively facilitates RTD for around three quarters of military personnel referred for assessment. Around a third of personnel in receipt of deployment mental healthcare went on to experience negative longer-term occupational outcomes; such outcomes were mostly related to pre-existing psychological vulnerability rather than combat exposure.

Introduction

Given the substantial rates of return to duty (RTD) previously reported amongst UK AF personnel who received mental healthcare while serving in Iraq (Jones et al., 2010), the current study examined the effectiveness of tertiary prevention delivered by Field Mental Health Teams in Afghanistan. This was felt to be particularly important as an internal briefing using the early results of the previous study detailed a number of recommendations to command about deployment mental healthcare. It was deemed timely to carry out a reassessment using a broader definition of occupational outcome to determine whether the revised deployment healthcare arrangements had achieved any substantial positive effects. In the previous study it was noted that the sample contained a large number of reserve forces personnel who, at the time of the study, could leave the military almost at will and may have affected the overall rates of early discharge in a substantial way.

The Effect of Potential Barriers to Help-Seeking

The deployed healthcare dataset provided an opportunity to examine a secondary research question regarding the effect of potential barriers to help seeking, which is a major strand of

this PhD thesis. Effective rapid treatment for mental health problems experienced during deployment may contribute to operational effectiveness; however, although clinical care is readily available from deployed mental health practitioners, accessing such care requires personnel to overcome physical and psychological barriers to receiving mental health support. As detailed in the introductory chapter, military personnel can be concerned about the potential adverse occupational consequences of declaring a mental health problem when deciding to seek treatment (Iversen et al., 2011). During deployment this may be in part related to the path that an individual has to follow to consult with a mental health professional; this usually involves an initial consultation with a medical practitioner or, in their absence, a unit commander. Self-referral or referrals made by a unit chaplain may be viewed subjectively as less concerning than a referral arranged by a unit commander as the latter could be viewed as making a potential mental health problem 'public'. As described in the introductory chapter, this could be associated with a perceived loss of status within a military unit and the possibility that leaders, and colleagues, might treat the individual differently. The hypothesis related to referral source which was tested in the secondary study component was that self or chaplain initiated referral was associated with greater numbers of personnel presenting with spurious or non-mental health related conditions as they were not 'pre-screened' prior to referral. Given that these forms of referral might also be associated with reduced fighting spirit and positive commitment to the UK military, it was also possible that longer-term occupational outcomes might be worse among this group.

Study Specific Methods

Sample

In order to establish the circumstances leading up to referral and the mental health and associated characteristics of those referred to the FMHT, data gathered during mental health

assessments conducted by FMHT clinicians among members of the three UK AF Services (Royal Navy (including Royal Marines), Army and Royal Air Force) deployed in Afghanistan were examined. After excluding reserves and later referrals, where outcomes were yet to be formalised, the clinical records of 611 individuals referred between May 2006 and September 2010 were examined.

Occupational Outcomes

Short-term Outcomes

Evacuation home or RTD status recorded by FMHT clinicians constituted the short-term occupational outcome and was available for 93.0% of cases (n=568).

Assessing the Predictors of Short-Term Occupational Outcome

For each referral, FMHT clinicians recorded socio-demographic and military characteristics including self-reported combat exposure, referral source, diagnosis, subsequent treatment or therapy and whether personnel were ultimately evacuated or RTD. In addition to self-reported combat exposure, additional variables were examined both as individual items and with the items organised into two distinct groups; firstly, psychological vulnerability factors and secondly, non-combat operational factors.

The 'psychological vulnerability' group was comprised of six self-reported items with an empirical link to poorer mental health. These included previous receipt of mental health assessment or therapy (Larson et al., 2011; Leardmann et al., 2009) one or more parents or siblings in receipt of past or present mental healthcare, which was designated 'family psychiatric history'(Dean et al., 2010), having a self-reported past history of traumatic

exposure before the current deployment (Breslau et al., 1999), lifetime episode(s) of deliberate self-harm (DSH) excluding the current deployment (Hawton et al., 2013), previous deployment mental health problems and recent substance or alcohol misuse (Hasin et al., 2007; Paljarvi et al., 2009).

A second, four item group constituting 'non-combat operational stressors' was formed which included self-reported difficulty adjusting to the operational environment, personal difficulties with the operational commander, welfare problems experienced by the family at home during the deployment period and experiencing relationship problems with one's intimate partner while deployed.

Items within the psychological vulnerability and non-operational stressor group were endorsed 'present' or 'absent' and were summed to produce a count variable so that comparisons could be made between those reporting lesser and greater numbers of category items. Tertiles were generated to compare greater levels of exposure to the two groups of items with lower levels. Personnel with scores in the upper tertile, which equated to reporting two or more items in each group, were compared with those reporting fewer (those in the middle and lower tertiles).

Mental Disorder Categories

Diagnostic categories were derived from in-depth clinical assessments carried out by FMHT clinicians; no psychometric scales were used. A judgment was made by FMHT clinicians as to whether there was a substantial association between mental health symptoms and recent combat exposure, represented by acute (combat) stress reaction and new-onset PTSD, or whether such symptoms were associated with non-combat exposure, represented by

adjustment and other psychiatric disorders. The meta-categories of disorder used in this study were combat exposure-related disorders, mood and anxiety disorders, general psychiatric conditions and no assigned diagnosis.

Longer-term Occupational Outcomes

To gauge the overall impact on longer-term occupational functioning over the four year post-deployment assessment period, three categories of negative outcome were examined and conflated. These were firstly, unplanned discharge from the military, secondly, reduced occupational fitness and lastly, indiscipline; these are described in full below. The resulting composite variable was labelled 'negative occupational outcome' and was compared with neutral occupational outcomes represented by continued service or uncomplicated completion of the individual's elective service term. Additional positive outcomes were grouped with neutral outcomes and included promotion in rank or undertaking further operational deployment. In the case of personnel who experienced both negative and positive outcomes (n=33), the most recent of these was categorised and used as the outcome variable. Longer-term outcome data was obtained by performing data linkage between individual entries in the clinical dataset and occupational information recorded in personnel databases obtained from Defence Statistics. All outcomes were therefore record-based rather than self-reported.

Long-term occupational fitness was defined by the medical employment standard recorded in the personnel record. As described in the introduction chapter of this thesis, to regulate military occupational health, the UK AF utilises a system of medical classification (MoD, 2006). The system assigns each service person to a medical employment standard which is dependent on their physical and psychological health status (MoD, 2007; MoD, 2006) and

determines whether they can be deployed. In the UK AF, medical employment standards can only be altered by a military doctor. Broad categories of deployment restriction are used to protect the person while their illness or mental disorder is managed or discharge from the military is arranged (PULLHEEMS Pamphlet. 2007). The standards are: fully deployable, deployable with substantial limitations and not deployable; to determine longer-term occupational outcome, the two reduced medical employment standards, representing an inability to fully carry out one's deployed role, were combined and compared with the fully deployable category.

Discharge from Service

Two forms of post-deployment discharge were examined: first, a category of overtly negative outcomes including discharge on medical grounds, administrative or discipline-related discharge and all discharges that occurred before the minimum elective term of service had been completed. The minimum required length of service is 4 years for Army, 3.5 years for Royal Air Force (RAF) and 4.5 years for Royal Navy (RN) personnel. For the purpose of the study, any of these mechanisms of exiting from the military were designated 'premature discharges'. Second, all discharges occurring within the 12 months following return from deployment were examined. Those personnel who came to the natural end point of their service were classed as normal service leavers. Having completed a minimum elective term of service, personnel can apply to leave at any time. In personnel records, this form of discharge is annotated premature voluntary release or 'PVR'. When the date of PVR was examined in the personnel records, in a small number of cases, the application to PVR had been submitted immediately upon return from deployment and may therefore have been

related to deployment mental health or adverse deployment experiences; this form of discharge was incorporated into the premature discharge category.

Indiscipline

The third component of the negative occupational outcome variable was military offending. Offences were identified in the personnel record and were dichotomised into those where the person was convicted and punished by the unit commanding officer, which, when the type of offence was examined, generally constituted a less serious military offence, or serious offences resulting in conviction at court martial and any punishment resulting in loss of rank.

For the final long-term occupational outcome variable, comparing combined positive and neutral with negative outcomes, data were available for 80.0% (n=489) of those referred to the FMHT.

Referral Source

To evaluate the secondary research question regarding potential barriers to care, short and long-term outcomes were compared between referrals from unit commanders and all other referral sources. In order to make this comparison, referral sources were grouped into three categories; those with little perceived occupational risk including self-referral and chaplain referrals; those with a moderate degree of negative occupational consequences, which included medical and welfare officer referrals and those with potentially the highest negative occupational consequences represented by unit commanders.

Exclusions

Personnel who were referred to the FMHT after September 2010, the date of data linkage (n=97), were not included in the analyses of long-term outcomes as insufficient time had elapsed for longer-term occupational outcomes to have developed and been recorded when data linkage was performed. Reserve forces personnel (n=45) were also excluded as their discharge options are distinct from those of regular force personnel whereby they are not required to complete a fixed minimum term of military service and can effectively leave on request. This study was approved by the Ministry of Defence Research Ethics Committee (MODREC, No 0836/191 dated 03 December 2010).

Analysis

The Statistics Package for Social Sciences (SPSS version 20) was used for the analyses. The standard approach to analyses was taken whereby the associations of categorical data were initially assessed using Pearson's chi squared (χ^2) test and were further explored using logistic regression to generate odds ratios (ORs) with 95% confidence intervals (CI) which were adjusted for potential confounders. Trends in the data were examined using chi squared (χ^2) test for trend. Statistical significance was defined as $p \leq 0.05$ throughout.

Results

Demographic Factors

A comparison with whole force figures suggested that personnel consulting with the FMHT were statistically significantly younger ($p<0.0001$) (Table 36), more likely to be deployed in a combat role ($p<0.0001$), to be in the Army ($p<0.0001$) and to hold a junior rank ($p<0.0001$) (All p values are for Pearson's chi squared test).

Table 36. FMHT Casualties - Demographic Characteristics

Demographic Characteristic		FMHT n (%)	Deployable Force %
***Age Group (in Years) (n=606)**	18-24	305 (50.3)	28.2
	25-29	147 (24.3)	22.9
	30-34	79 (13.0)	16.7
	≥35	75 (12.4)	32.2
[b] *Role (n=611)	Combat	292 (47.8)	34.0
	Combat Support Arm	141 (23.1)	30.0
	Combat Service Support Arm	178 (29.1)	36.0
***Service (n=611)**	Royal Navy	17 (2.8)	[a] 20.3
	Royal Marines	39 (6.4)	
	Army	525 (85.9)	[a] 55.5
	Royal Air Force	30 (4.9)	[a] 24.2
Sex (n=611)	Male	551 (90.2)	90.4
	Female	60 (9.8)	9.6
***Rank Groups (n=611)**	Commissioned Officer	19 (3.1)	17.1
	Senior Non-Commissioned Officer	58 (9.5)	22.7
	Junior Non-Commissioned Officer	192 (31.4)	60.2
	Private Soldier or Equivalent	342 (56.0)	
FU vs. IA Personnel (n=607)	Formed Unit (FU) Personnel (Deployed with peers)	453 (74.6)	Not Available
	Individual Augmentee (IA) Personnel (Deployed alone)	154 (25.4)	
Previous Tours (n=600)	None	249 (41.5)	
	One or More	351 (58.5)	
Service Length (n=597)	<4 Years	302 (50.6)	
	≥4 Years	295 (49.4)	
Relationship Status (n=608)	In a Long-Term Relationship	189 (31.1)	
	Not In a Long-Term Relationship	419 (68.9)	
Dependant children (n=562)	None	307 (54.6)	
	One or More	255 (45.4)	

*$p<0.0001$

[a] Characteristics varied with time over the period of data collection, therefore an average number for 8 deployment years is shown

[b] RAF and RN personnel recoded as Combat, CSA or CSS classified using the role of the unit that they were deployed with

Reported percentages and numbers may not sum to sample and sub-sample totals due to missing data.

Occupational Outcome Frequencies and Categories

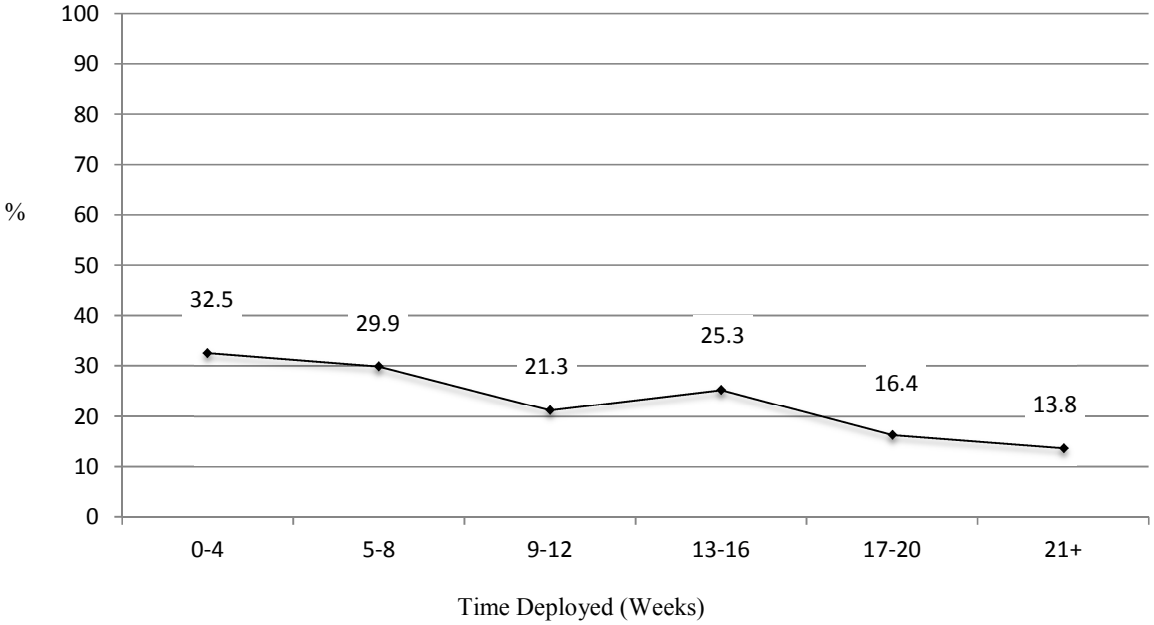
For short-term outcomes, 76.8% (n=436) of FMHT attendees successfully returned to full duties in their operational unit. In the longer term, 66.5% (n=296) either continued to serve or had completed their elective service term without negative medical or administrative consequences, however, 33.5% (n=149) experienced a long-term negative occupational

outcome. Of the negative occupational outcomes, 6.7% (n=10) of personnel were prematurely or administratively discharged; 2.7% (n=4) applied for premature release and were discharged within 12 months of referral to the FMHT; 9.4% (n=14) were medically discharged from service; 4.0% (n=6) were demoted; 6.7% (n=10) committed a serious disciplinary offence and 70.5% (n=105) were not deployable on medical grounds or were deployable with substantial limitations.

Predisposing and Precipitating Factors for Occupational Outcomes

No socio-demographic and military factors were significantly associated with RTD or longer-term occupational outcomes. Self-reported deliberate self-harm prior to deployment ($p<0.01$), family mental health history ($p=0.01$), experiencing problems with the operational commander ($p=0.01$), having difficulty adjusting to the operational environment ($p<0.001$), and threatening or carrying out an act of self-harm ($p<0.001$) were all significantly associated with evacuation from the operational area in univariable analyses (Pearson's chi squared test). When personnel had deployed for less than 14 weeks before referral, the mid-point of a standard deployment, they were significantly more likely to be evacuated ($p<0.05$). There was a significant linear trend where, as time in the operational area increased, the likelihood of being evacuated reduced from 32.5% (n=26 of 80) in the first four weeks of deployment to 13.8% (n=9 of 65) at 21 weeks plus (χ^2 test for linear trend =9.66 d.f. 1 $p<0.01$) (Figure. 5).

Figure 5. Rates of Evacuation (%) and Time Deployed in Weeks



Reporting ≥2 psychological vulnerability items (p=0.05) and ≥2 non-combat stressors (p<0.001) significantly increased the likelihood of subsequent evacuation. In the univariable analyses, recent combat exposure was associated with a significantly lower rate of evacuation (p<0.01) (Table 39).

All factors assessed in relation to RTD were further evaluated for their association with longer-term occupational outcomes; in univariable analyses, none were found to be significantly associated with the exception of reporting ≥2 psychological vulnerability factors and having a history of previous traumatic exposure (both p<0.05) (Table 37).

Table 37. FMHT Casualties - Major Precipitant/Predisposing Factors and Occupational Outcomes

	Short-term Occupational Outcomes			Long-term Occupational Outcomes		
Factor	**n (%)**	**EVAC**	**RTD**	**n (%)**	**-ve**	**+ve or Neutral**
Return to Duty		NA	436 (76.8)	323 (77.5)	104 (32.2)	219 (67.8)
Evacuated from Deployment		132 (23.2)	NA	94 (22.5)	34 (36.2)	60 (63.8)
Time Deployed n (%)						
0-14 Weeks	295 (60.3)	***79 (26.8)**	**216 (73.2)**	222 of 382 (58.1)	81 (36.5)	141 (63.5)
15 Weeks or More	194 (39.7)	***37 (19.1)**	**157 (80.9)**	160 of 382 (41.9)	44 (27.5)	116 (72.5)
Psychological Vulnerability n (%)						
Previous Mental Health Assessment	180 of 565 (31.9)	49 (27.2)	131 (72.8)	147 of 444 (33.1)	55 (37.4)	92 (62.6)
Family Mental Health History	113 of 529 (21.4)	****35 (31.0)**	**78 (69.0)**	89 of 417 (21.34)	29 (32.6)	60 (67.4)
Previous Traumatic Exposure	106 of 563 (18.8)	30 (28.3)	76 (71.7)	83 of 441 (18.8)	***36 (43.4)**	**47 (56.6)**
Previous Deliberate Self Harm	87 of 560 (15.5)	***31 (35.6)**	**56 (64.4)**	69 of 332 (20.8)	28 (40.6)	41 (59.4)
Previous Tour Mental Health Problem	41 of 557 (7.4)	10 (24.4)	31 (75.6)	31 of 440 (7.1)	9 (29.0)	22 (71.0)
Current Substance Use	13 of 564 (2.0)	2 (15.4)	11 (84.6)	8 of 443 (1.8)	2 (25.0)	6 (75.0)
Psychological Vulnerability Count (Max Score 6) n (%)						
Upper Tertile (Scores ≥2)	153 of 566 (27.0)	***46 (30.1)**	**107 (69.9)**	134 of 488 (27.5)	***52 (38.8)**	**82 (61.2)**
Non-Combat Operational Stressors n (%)						
Operational Environment Problems	250 of 564 (44.3)	*****76 (30.4)**	**174 (69.6)**	189 of 443 (42.7)	58 (30.7)	131 (69.3)
Problems With Family at Home	143 of 559 (25.6)	37 (25.9)	106 (74.1)	97 of 441 (22.0)	31 (32.0)	66 (68.0)
Problems With Partner at Home	137 of 561 (24.4)	37 (27.0)	100 (73.0)	112 of 486 (23.1)	36 (32.1)	76 (67.9)
Problems with Operational Commander	128 of 566 (22.6)	****40 (31.2)**	**88 (68.8)**	94 of 444 (21.2)	27 (28.7)	67 (71.3)
Non-Combat Operational Stressor Count (Max Score 4) n (%)						
Upper Tertile (Scores ≥2)	199 of 565 (35.2)	*****65 (32.7)**	**134 (67.3)**	140 of 443 (31.6)	42 (30.0)	98 (70.0)
Operational Combat Exposure n (%)						
Exposed	228 of 565 (40.4)	****39 (17.1)**	**189 (82.9)**	190 of 442 (43.0)	63 (33.2)	127 (66.8)
Current Deliberate Self-Harm n (%)						
Current DSH Threat or Act	148 of 567 (26.1)	*****72 (48.6)**	**76 (51.4)**	110 of 444 (24.8)	38 (34.5)	72 (65.5)

* $p<0.05$ ** $p\leq0.01$ *** $p\leq0.001$
Reported percentages and numbers may not sum to sample and sub-sample totals due to missing data.

Short and longer-term occupational outcomes were compared across four mental disorder categories. These were, disorders related to combat exposure, 24.1% (n=139) (combat stress reaction 17.0%; PTSD 2.3%; reaction to severe stress 4.8% of all disorders), anxiety or depressive disorders, 14.0% (n=81) (bipolar affective disorder 1.9%; panic disorder 2.1%; depression 5.5%; anxiety disorder 4.5% of all disorders), general psychiatric disorders, 40.3% (n=233) (adjustment disorder 29.1%; acute stress reaction 6.2%; neurotic spectrum disorders 2.3%; alcohol misuse 0.7%; psychosis 0.5%; personality disorder 1.6% of all disorders) and no recorded diagnosis, 21.6% (n=125). In unadjusted logistic regression, no category of disorder was significantly associated with evacuation when compared with personnel with no mental disorder with the exception of those diagnosed with anxiety and depressive disorders who were significantly more likely to experience longer-term negative occupational outcomes. In adjusted regression analyses, the mental health disorder categories were associated with neither RTD nor longer-term occupational outcomes (Table 38). The RTD rate remained high amongst those personnel who did not receive a psychiatric diagnosis but had fallen significantly from a RTD rate of around 90.0% in this category in Iraq (Jones et al., 2010) to around 80.0% in the current study (χ^2=3.57, d.f.1 p<0.05).

Table 38. FMHT Casualties - Main Diagnostic Categories, Return to Duty and Reduced Occupational Outcome Rates

Mental Health Problem (n=578)	Short-term outcomes				
	n (%)	RTD	Evac	OR (95% CI)	*AOR (95% CI)
No Assessed Psychiatric Condition	**125 (21.6)**	97 of 120 (80.8)	97of 120 (19.2)	**1**	1
Related to Combat Exposure	**139 (24.1)**	104 of 134 (77.6)	30 of 134 (22.4)	0.82 (0.45-1.51)	0.80 (0.43-1.49)
Anxiety or Depressive (Mood) Disorders)	**81 (14.0)**	55 of 75 (73.3)	20 of 75 (26.7)	0.65 (0.33-1.29)	0.60 (0.30-1.21)
General Psychiatric Disorders	**233 (40.3)**	97 of 212 (73.6)	56 of 156 (26.4)	0.66 (0.38-1.14)	0.69 (0.39-1.21)
Mental Health Problem (n=432)	**Long-term outcomes**				
	n (%)	**Negative Outcome**	**+ve or neutral**	**OR (95% CI)**	****AOR (95% CI)**
No Assessed Psychiatric Condition	87 (20.1)	22 (25.3)	65 (74.7)	1	1
Related to Combat Exposure	113 (26.2)	38 (33.6)	75 (66.4)	1.50 (0.80-2.79)	1.29 (0.63-2.68)
Anxiety or Depressive (Mood) Disorders)	54 (12.5)	25 (46.3)	29 (53.7)	**2.55 (1.24-5.24)**	2.12 (0.98-4.59)
General Psychiatric Disorders	178 (41.2)	57 (32.0)	121 (68.0)	1.39 (0.78-2.48)	1.19 (0.65-2.19)

*AORs Adjusted for: demographics, including, for age, rank, sex, relationship status, engagement type, service length, individual augmentee or formed unit personnel, combat arm, psychological vulnerability, non-combat operational stress, combat exposure, DSH threat or act, (longer-term outcomes adjusted additionally for evacuation from operations)

Reported percentages and numbers may not sum to sample and sub-sample totals due to missing data.

Predictors of Short and Long-Term Occupational Outcomes; Adjusted Analyses

Following adjustment for observed potential confounders, family history of mental disorder, difficulty adjusting to the operational environment, exposure to non-combat operational stressors and threatening or actually self-harming whilst in the operational area were all significantly associated with evacuation (Table 41). A history of deliberate self-harm prior to deployment, reporting ≥2 items from the psychological vulnerability scale and experiencing problems with one's operational commander were no longer significantly associated with evacuation when adjusted for current DSH threats or acts. Reporting current combat exposure was no longer significant after adjusting for non-operational stressors. Spending a shorter amount of time in the operational area prior to referral was only borderline significant prior to adjustment after which it was not significantly associated. Endorsing ≥2 psychological vulnerability items was significantly associated with longer-term negative

occupational outcomes in the adjusted analyses; however, previous traumatic exposure became non-significant when adjusted for potential confounders (Table 39).

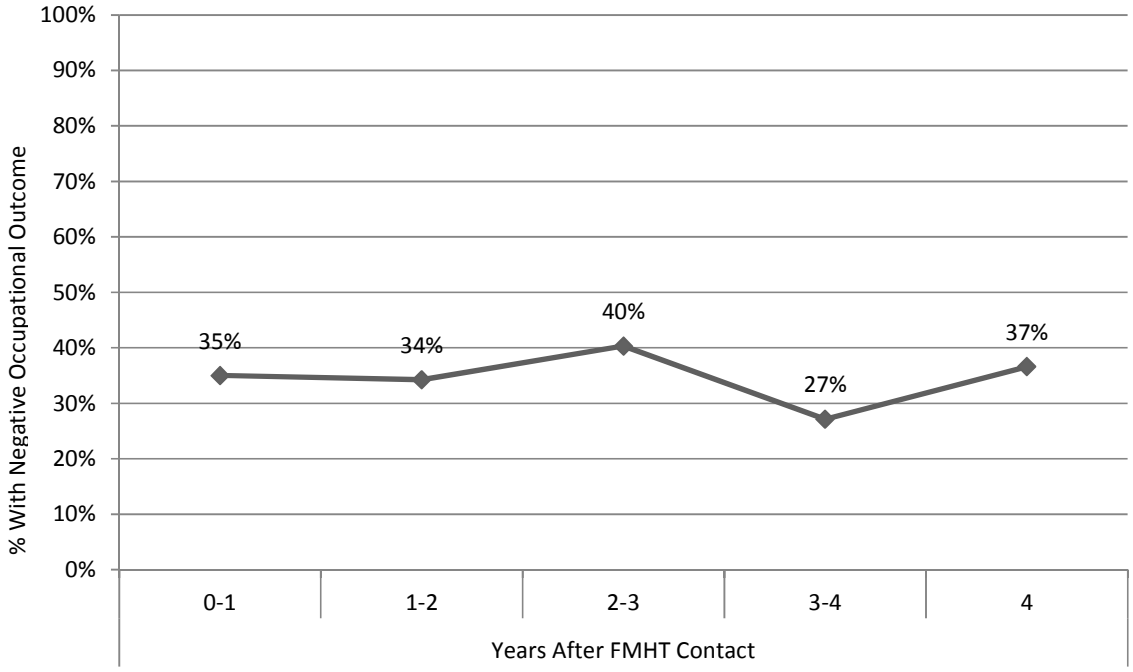
Table 39. FMHT Casualties - Predictors of Occupational Fitness Unadjusted and Adjusted Odds Ratios and 95% Confidence Intervals

Short-Term Occupational Outcomes	OR	AOR[1]	AOR[2]	AOR[3]	AOR[4]	AOR[5]
Deployed for 0-14 Weeks	1	1	1	1	1	1
Deployed for 15 or More Weeks	**0.64 (0.41-1.00)**	**0.63 (0.40-0.99)**	**0.63 (0.39-0.99)**	0.70 (0.44-1.11)	0.71 (0.44-1.13)	0.62 (0.38-1.02)
No Previous Deliberate Self Harm	1	1	1	1	1	1
Previous Deliberate Self Harm	**2.12 (1.30-3.46)**	**2.33 (1.41-3.86)**	***2.24 (1.35-3.73)**	**2.07 (1.24-3.45)**	**2.16 (1.29-3.59)**	1.32 (0.75-2.31)
No Family Mental Health History	1	1	1		1	1
Family Mental Health History	**1.83 (1.15-2.91)**	**1.97 (1.22-3.19)**	****1.89 (1.17-3.07)**	**1.77 (1.08-2.90)**	**1.88 (1.16-3.06)**	**1.78 (1.06-2.98)**
≤1 Psychological Vulnerability Lower	1	1	NA	1	1	1
≥2 Psychological Vulnerability Higher	**1.66 (1.09-2.51)**	**1.84 (1.18-2.87)**		**1.66 (1.06-2.62)**	**1.77 (1.13-2.78)**	1.34 (0.83-2.17)
No Problems With Operational Commander	1	1	1	1	1	1
Problems With Operational Commander	**1.73 (1.12-2.69)**	**1.79 (1.14-2.82)**	**1.76 (1.11-2.78)**	*****1.77 (1.12-2.80)**	**1.59 (1.00-2.53)**	1.37 (0.83-2.24)
No Problems With the Operational Environment	1	1	1	1	1	1
Problems With the Operational Environment	**2.10 (1.41-3.13)**	**2.10 (1.38-3.20)**	**1.94 (1.28-2.95)**	******2.01 (1.33-3.04)**	**1.10 (1.30-3.02)**	**1.64 (1.04-2.57)**
≤1 Non-Combat Operational Stressors	1	1	1	NA	1	1
≥2 Non-Combat Operational Stressors	**2.25 (1.51-3.35)**	**2.25 (1.49-3.40)**	**2.12 (1.40-3.22)**		**2.00 (1.29-3.11)**	**1.64 (1.05-2.56)**
No Current Combat Exposure	1	1	1	1	NA	1
Current Combat Exposure	**0.55 (0.36-0.84)**	**0.52 (0.33-0.81)**	**0.54 (0.34-0.85)**	0.66 (0.41-1.07)		0.80 (0.49-1.29)
No Current Deliberate Self-Harm Threat or Act	1	1	1	1	1	NA
Current Deliberate Self-Harm Threat or Act	**5.78 (3.78-8.83)**	**6.11 (3.94-9.47)**	**5.99 (3.82-9.36)**	**5.68 (3.62-8.91)**	**5.88 (3.73-9.26)**	
Long-Term Occupational Outcomes						
No Previous Traumatic Exposure	1	1	1	1	1	1
Previous Traumatic Exposure	**1.66 (1.02-2.71)**	1.49 (0.88-2.51)	1.25 (0.71-2.21)	1.46 (0.86-2.48)	1.54 (0.90-2.64)	1.49 (0.88-2.51)
Psychological Vulnerability Cluster						
Psychological Vulnerability 0-1 Item	1	1	N/A	1	1	1
Psychological Vulnerability 2 or More	**1.61 (1.05-2.49)**	**1.62 (1.01-2.59)**		**1.69 (1.05-2.72)**	**1.63 (1.01-2.63)**	**1.66 (1.02-2.70)**

AOR[1] Adjusted for demographics, including, for age, rank, sex, relationship status, service length, individual augmentee or formed unit, combat arm (adjusted additionally for evacuation from operations for long-term outcomes)
AOR[2] Adjusted for demographics and psychological vulnerability
AOR[3] Adjusted for demographics and non-combat operational stress
AOR[4] Adjusted for demographics and combat exposure
AOR[5] Adjusted for demographics and DSH threat or act
* Adjusted for psychological vulnerability with the previous deliberate self-harm component removed
** Adjusted for psychological vulnerability with the family mental health history component removed
***Adjusted for non-combat operational stressors with the operational commander problem component removed
****Adjusted for non-combat operational stressors with the operational environment problem component removed
Reported percentages and numbers may not sum to sample and sub-sample totals due to missing data.

Negative occupational outcomes occurred at a rate of 35.0% in the first year following discharge from FMHT care, 34.3% in year 1-2, 40.3% during year 2-3, 27.1% in year 3-4 and 36.6% in year 4 (χ^2=4.03 d.f. 4 p=0.40). There was no evidence of a statistically significant trend in the data (χ^2 test for trend=0.23, p=0.63) (Figure. 6)

Figure 6. Longer-term Occupational Outcomes and Period of Time since Assessment



To examine whether the period following discharge from FMHT care influenced the association between the predictors that were found to be significantly associated with longer-term outcomes, odds ratios with 95% confidence intervals were calculated for each predictor adjusting for time period since assessment by the FMHT. Previous traumatic exposure and psychological vulnerability remained significantly associated irrespective of the effect of variable periods of follow-up (Table 40).

Table 40. FMHT Casualties - Predictors of Occupational Outcomes Adjusted for Time Since Assessment

Predictors of Long-Term Occupational Outcome	*AOR 95% CI
No Previous Traumatic Exposure	1
Previous Traumatic Exposure	**1.66 (1.02-2.70)**
Psychological Vulnerability 0-1 Item	1
Psychological Vulnerability 2 or More	**1.61 (1.04-2.48)**

*Adjusted for time since contact with the FMHT

Referral Source and Occupational Outcome

The most common source of referral was the Unit Medical Officer (n=377, 66.6%); 17.3% (n=98) came from the unit commander (high barrier); 11.5% (n=65) by self-referral (low barrier); 3.2% (n=18) from the chaplain (low barrier); and 1.4% (n=8) from a welfare officer (medium barrier). The effect of referral source upon short-term outcomes was examined and no significant association was found. 17.3% (n=17) of those with greater potential barriers to surmount were evacuated, 24.2% (n=93) of moderate potential barriers and 26.5% (n=22) of lower barriers ($\chi 2$=2.58 d.f. 2 p=0.28). The effect of referral source upon longer-term outcomes was examined and no significant association was found. 25.6% (n=20) of those with greater potential barriers to surmount experienced negative longer-term outcomes, moderate 34.9% (n=99) and lower 37.0% (n=30) ($\chi 2$=2.84 d.f. 2 p=0.24) (Table 41).

Cases classified as having no psychiatric diagnosis were evenly distributed among the various referral sources. Cases with no diagnosis assigned following assessment comprised 18.9% (n=18) of referrals from low threshold sources, 22.0% (n=84) of referrals from medium threshold sources and 23.2% (n=23) of referrals from high threshold sources ($\chi 2$=0.58 d.f. 2 p=0.75).

Table 41. FMHT Casualties - Hypothesised Barriers to Help-seeking and Occupational Outcome

Referral Source	Short-Term Occupational Outcome				Longer-Term Occupational Outcome		
	*Barrier	EVAC	RTD	χ^2, d.f. p=	+ve/Neutral	Negative	χ^2, d.f. p=
Commander (98)	High	17 (17.3)	81 (82.7)	χ^2=2.58 d.f. 2 *p*=0.28	62 (74.7)	21 (25.3)	χ^2=2.05 d.f. 2 *p*=0.36
Medical Officer (377)	Med	93 (24.2)	292 (75.8)		213 (67.2)	104 (32.8)	
Welfare (8)							
Self-Referral (65)	Low	22 (26.5)	61 (73.5)		57 (65.5)	30 (34.5)	
Chaplain (18)							

*Hypothesised Barrier to Help-Seeking

Main Findings

The first study hypothesis was that assessment and/or management by the FMHT would return around three quarters of personnel to their operational unit where they would continue to serve. This hypothesis was fully supported. A secondary objective was to describe the predictors of reduced short-term and longer-term occupational fitness. Evacuation was more likely to occur when greater numbers of operational stressors unrelated to combat were present. These included difficulty adjusting to the operational environment, threatening to or actually carrying out self-harm whilst deployed and experiencing greater psychological vulnerability; specifically, having a close family member with a history of mental disorder. Although spending a shorter time deployed was significantly associated with evacuation in the unadjusted analyses, this effect became borderline non-significant in adjusted analyses. When compared with whole force data, FMHT attendees were significantly younger, more likely to hold junior rank, to be Army personnel and to have a combat role. The second study hypothesis was that around three quarters of military personnel would be occupationally fully

fit and free from adverse occupational consequences at any time during the four years following return from deployment. This hypothesis was not supported as around a third of personnel went on to experience a longer-term negative occupational outcome. Although negative longer-term outcomes were unrelated to evacuation they appeared to be mainly related to pre-deployment psychological vulnerability. The nature of the assigned mental health diagnosis was not associated with either short or longer-term occupational outcome. There was no evidence that referral source had any effect upon both short and long-term outcomes and self and chaplain referrals were not significantly associated with non-receipt of a mental health diagnosis.

CHAPTER 10 - TERTIARY PREVENTION - SHORT AND LONG TERM OCCUPATIONAL FITNESS FOLLOWING COMMUNITY MENTAL HEALTH CARE AMONG UK MILITARY PERSONNEL

Overview

This chapter describes a study of tertiary prevention in the form of community based clinical care delivered to military personnel in the non-deployed setting. In this setting, tertiary prevention is related to the ability of military personnel to undertake their military role after receiving intervention for suspected mental ill-health. All United Kingdom Armed Forces (UK AF) personnel with suspected mental health problems are initially assessed by their medical officer and some are referred for assessment in a military Department of Community Mental Health (DCMH). Assessments are carried out by healthcare professionals and personnel are assigned an occupational fitness grading on completion of care which reflects their ability to undertake specific duties including operational deployment. Following mental health assessment or intervention, personnel who are deemed permanently medically unfit may be discharged from military service. Little is known about the longer-term impact of referral for mental health assessment upon military occupational fitness after completion of care. Socio-demographic, clinical, psychological and short-term occupational fitness information for new patients assessed in a military DCMH was recorded in clinical casenotes which were linked to a personnel database containing individual records of longer-term occupational fitness. Short-term occupational fitness was recorded following 2979 episodes of care and longer-term occupational fitness grading recorded for 1205 personnel. Adjusted logistic regression was used to assess the association between a range of predictor variables and both short and longer-term occupational fitness. The latter was categorised as fully fit for deployment or not and whether individuals were still serving or had been discharged from

service, fit for service in a restricted capacity and discharge from service in adverse circumstances including discharge on medical grounds. 78.0% of personnel were graded as occupationally fully fit for deployment on completion of care and 62.8% remained fully fit when followed up. Reduced occupational fitness rates were higher among DCMH referrals than among personnel in the whole of the UK AF at all time-points after completing the care episode. Clinical factors such as diagnosis, type of intervention received, prior history of psychiatric care, previous episodes of deliberate self-harm and multidisciplinary team (MDT) involvement as opposed to management by a single clinician were the main determinants of short-term reduced occupational fitness. MDT involvement and being in the Army were the main risk factors for longer-term reduced occupational fitness. Female sex and having a history of past referral to psychiatric services were more marginally associated with long-term occupational fitness. When factors other than clinical features were adjusted for, deployment in the year prior to referral was associated with a lower rate of reduced occupational fitness. In the UK AF, being referred for mental health assessment appears to be associated with reduced longer-term occupational fitness in around a third of those assessed or managed. However, this effect might be similar among attendees with physical illness attending any secondary healthcare facility.

Introduction

The introductory chapter described the available evidence that occupational fitness is often associated with a range of negative economic, psychological and social outcomes. By examining longitudinal occupational data, this study examined the short and longer-term occupational effects of receiving mental health treatment among non-deployed UK military personnel. Based upon published data (Gould et al 2008), community-based military mental healthcare should return around 70.0% of those referred to full occupational fitness.

Secondly, as mental health status has been empirically linked to lower levels of occupational fitness, receiving mental healthcare within a military context should be associated with a higher annual rate of reduced occupational fitness than that found among the UK AF as a whole.

Study Specific Methods

Occupational fitness was assessed among new patients referred by military primary healthcare facilities to a DCMH providing care to military personnel located within the catchment area of a Royal Air Force base between Jan 2002 and Sept 2011. Data were entered into a Windows-based Microsoft Access database designed to record socio-demographic, clinical, psychological, intervention and occupational fitness or discharge information. The database also functioned as a caseload management tool and was designed to produce information for ongoing clinical audit. Data were entered from dropdown menus wherever possible to ensure that the input format was standardised and instructions for entering data were attached as labels to each entry field. The dataset for the current study was exported into Stata version 11 using a direct transfer tool.

Variables Considered

Self- Reported Socio-demographic and Military Characteristics

Relationship status was dichotomised as having no current partner and being in a short-term or newly embarked on relationship which was contrasted with being married, in a civil partnership, or in a long-term relationship. Single parental status was represented by a dichotomous variable consisting of parents with a dependant child or children who were

living with a partner and those who had children but were not living with a partner. Combat role was generated by grouping personnel into those who had a military role requiring them to engage directly with and fight the enemy (combat); providing close support to enable combat to take place (combat support) or those who provided logistic support for military units conducting combat operations (combat service support). Operational deployment was a count variable and was restricted to personnel who had undertaken a combat, peace support, peace enforcement or peacekeeping deployment rather than an overseas exercise or routine overseas detachment.

Clinical and Intervention Characteristics

For clinical and therapeutic factors, the 'intervention type' variable consisted of three categories; 1. assessment and advice, which consisted of 1-2 sessions each of approximately one hour duration. 2. psychological intervention alone and 3. prescription of psychoactive medication with or without additional intervention. Intervention intensity was coded according to the number of sessions received; brief intervention consisted of one to six sessions, intermediate intervention of seven to 12 sessions and prolonged intervention of 12 or more sessions. Multi-disciplinary team (MDT) cases were those patients who were managed by the DCMH team as opposed to being managed by a single clinician. Deliberate self-harm (DSH) related to intentional self-injury of any cause. Alcohol use was recorded by the assessing therapist as the number of units consumed each week at the point of referral. The World Health Organization system was used to classify consumption stratified by gender into three categories; for men, use was classified as within safe limits (≤21 units per week), hazardous use (22-49 units) and harmful use (≥50 units). For women, usage was classified as within safe limits (≤14 units per week), hazardous use (15-35 units) and harmful use (≥35 units) (Andrews and Jenkins. 1999). Clinical diagnosis other than alcohol misuse was

assigned based upon International Classification of Mental Disorders Version 10 criteria (ICD 10, WHO, 1992) and disorders were grouped into broad descriptive categories for the purpose of the study. A further category was generated for personnel who were not assigned a diagnosis following assessment. The alcohol categories were combined with diagnosis to produce an alcohol co-morbidity variable. Past referral to psychiatric services was recorded as being present or absent.

Short and Longer-term Occupational Fitness

1. Short-term occupational fitness was measured on discharge from care and consisted of a dichotomised variable. The categories were firstly, being medically graded as fully deployable and secondly, a combined category comprised of having a medically non-deployable grading, a deployable with limitations grading or being medically or administratively discharged. The second category represented any level of occupational impairment.

2. Longer-term occupational fitness was represented by the medical fitness grading after a period of six months post-discharge from the DCMH to four or more years post-discharge; the categories were; 1. being medically graded as fully deployable and 2. being medically non-deployable, deployable with limitations or being medically or administratively discharged. To obtain information about longer-term occupational fitness, data linkage was performed between the clinical dataset and a personnel management database containing records of current medical fitness grading or the method and date of exit from the AF. Data linkage was performed using a unique identifier, the person's Service number. The data linkage process was approved by the MoD Research Ethics Committee (Ref 0836/191 dated 30th July 2008) as audit/service evaluation. Following data linkage, the dataset was

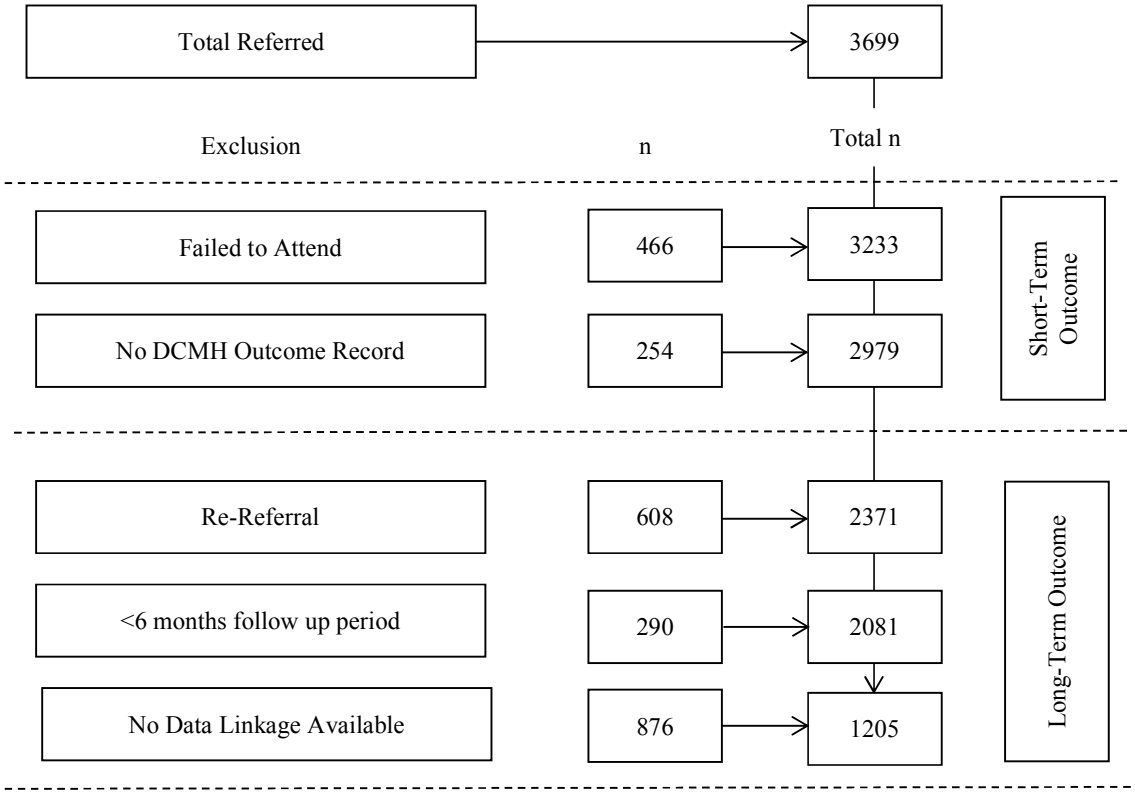
anonymised.

The socio-demographic, clinical, and psychological characteristics of personnel graded as limited deployable, not deployable or adversely discharged were compared with those who were either deployable with no limitations or who had completed their elective term of service with no medical restrictions.

Sample

The sample consisted of 3699 patients who were referred to the DCMH (Figure. 7). To assess short-term occupational fitness, those who failed to attend (FTA) for initial assessment and those with no recorded occupational grading were removed from the dataset, generating a sample of 2979 personnel. To evaluate long-term occupational fitness, in addition to the FTA and no recorded outcome categories, in the case of personnel with multiple referrals to the department, only the latest referral episode was retained and assessed in relation to occupational fitness. To avoid overlap with short-term outcomes and to allow personnel the opportunity to regain a full fitness grading following DCMH management, cases where less than six months had elapsed between discharge from the DCMH and the date of data linkage were excluded. This generated a sample of 2081 patients for whom information was available in 1205 cases (57.9%).

Figure 7. Occupational Fitness Analyses - Inclusions and Exclusions



Statistical Analyses

All analyses were conducted in Stata version 11. Pearson's chi squared test was used to assess the statistical significance of the association between predictor variables, including socio-demographic and military characteristics, clinical factors, psychological characteristics, intervention, and short and long-term occupational fitness. Predictor variables that were found to be significantly associated with the two occupational fitness outcomes in univariable analyses were further assessed using logistic regression to generate odds ratios (ORs) with 95% confidence intervals (95% CIs). These were adjusted for potentially confounding variables in blocks and additionally for time since referral. Block one was comprised of socio-demographic factors, block two encompassed operational factors, block three included clinical and psychological factors and finally all factors were entered into the model as a

single block. For non-binary categorical variables, between sub-category comparisons were made using multinomial logistic regression. Interaction terms were created to assess interactions among factors that appeared to represent clinical and therapeutic complexity. Trends over time were assessed with chi squared test for trend.

Potential Bias Related to Exclusions

Although it was not possible to test for mental health status at baseline between those who attended for initial assessment and those who did not, Service background, gender, relationship status, rank and regular or reserve service type were not significantly different between attendees and non-attendees. Personnel under the age of 25 years were significantly more likely to fail to attend than older personnel (χ^2=14.73 d.f. 1 p<0.001).

Bias arising from socio-demographic factors was assessed among those for whom longer-term occupational fitness data was available and those for whom it was not. Army personnel were significantly less likely to have longer-term occupational fitness data recorded than Royal Air Force or Royal Navy/Royal Marines (χ^2=9.44 d.f. 1 p<0.01) as were reserve forces personnel (χ^2=20.60 d.f. 1 p<0.001) and those not in a longer-term relationship (χ^2=4.48 d.f. 1 p<0.05). Military rank was not significantly different between the groups. The proportion of both men and women who were and were not followed up was not significantly different, those with a confirmed mental health disorder were significantly more likely to have an occupational record available (χ^2=5.55 d.f. 1 p<0.05). Multivariable logistic regression suggested that a single variable, being in the Army, was significantly associated with longer-term outcome data availability (OR 0.41 95% CI 0.35-0.49). A response weight was generated using the *predict p* Stata command using data availability as the dichotomous

dependent variable. All subsequent analyses of longer-term occupational fitness were weighted and carried out using the *svy.* command in Stata.

Results

Sample Characteristics

73.4% of the patients in the DCMH sample were from the RAF (n=2187), 23.7% were Army personnel (n=705) and around 3% were Royal Navy personnel (n=87). 96.2% were serving on a regular rather than a reserve forces engagement. 27.6% were women (n=823), 46.7% were in a long-term relationship (n=1337) and 13.8% were lone parents (n=395). The age distribution of the sample was generally representative of the UK AF (Defence Statistics. 2013); 67.5% (n=2007) were junior ranks or junior non-commissioned officers which compared with 60.2% in the UK AF. The majority had non-combat roles, with 19.1% (n=566) serving in combat or close support roles. 56.2% of the patients had served for less than nine years (n=1450), 40.6% (n=1799) had undertaken operational deployment; 13.1% (n=327) had deployed in the year prior to referral (Table 42).

Intervention and Clinical Characteristics

54.7% of those referred subsequently received psychological intervention (n=1585), 32.3% were assessed, given advice and discharged (n=936) and 12.9% (n=374) were prescribed medication alone or in conjunction with other forms of support. 82.6% (n=2391) received brief intervention (1-6 sessions), 9.9% (n=287) received intermediate intervention (7-12 sessions) and 7.5% (n=218) received prolonged intervention (12 or more sessions). Around one fifth of all cases were managed by the multidisciplinary team (n=610); the remainder

(n=2369) were managed by a single therapist. 181 (6.1%) were referred following an act of deliberate self-harm and 361 (12.1%) had a prior history of deliberate self-harm; over half (n=1551) had a pre-military or during military service history of referral to psychiatric services. 22.9% of men (n=410) were consuming hazardous or harmful levels of alcohol compared to 21.5% of women (n=150). 385 (14.7%) of personnel had mental disorders co-morbid with hazardous or harmful alcohol use. The most commonly referred psychiatric disorder was moderate to severe adjustment disorder (37.1%, n=1105) followed by anxiety or mood disorder (28.2%, n=840); the least commonly referred problems were psychotic illnesses and personality disorders (1.0%, n=30) (Table 43).

Table 42. Demographic, Operational Characteristics and Short-term Occupational Fitness

Demographic Characteristic	Occupationally Fit	Occupationally Unfit	$\chi 2$, d.f., p
***Service** (n=2979)			
Royal Navy/Royal Marines 87 (2.9)	66 (75.9)	21 (24.1)	$\chi 2$=5.62 d.f. 2 p=0.60
Army 705 (23.7)	528 (74.9)	177 (25.1)	
Royal Air Force 2187 (73.4)	1729 (79.1)	458 (20.9)	
Engagement Type (n=2979)			
Regular Forces 2867 (96.2)	2235 (78.0)	632 (22.0)	$\chi 2$=0.24 d.f. 1 p=0.88
Reserve Forces 112 (3.8)	88 (78.6)	24 (21.4)	
Sex (n=2979)			
Male 2156 (72.4)	1698 (78.8)	458 (21.2)	$\chi 2$=2.75 d.f. 1 p=0.10
Female 823 (27.6)	625 (75.9)	198 (24.1)	
Relationship Status (n=2864)			
In a Long-Term Relationship 1337 (46.7)	1033 (77.3)	304 (22.7)	$\chi 2$=0.31 d.f. 1 p=0.58
Not In a Long-Term Relationship 1527 (53.3)	1193 (78.1)	334 (21.9)	
Parental Status (n=2864)			
Not a Single Parent 2469 (86.2)	1912 (77.4)	557 (22.6)	$\chi 2$=0.83 d.f. 1 p=0.36
Single Parent 395 (13.8)	314 (79.5)	81 (20.5)	
Age Group (in Years) (n=2960)			
17-19 Years 151 (5.1)	116 (76.8)	35 (23.2)	$\chi 2$=7.18 d.f. 6 p=0.31
20-24 Years 664 (22.4)	534 (80.4)	130 (19.6)	
25-29 Years 572 (19.3)	452 (79.0)	120 (21.0)	
30-34 Years 527 (17.8)	407 (77.2)	120 (22.8)	
35-39 Years 562 (19.0)	432 (76.9)	130 (23.1)	
40-44 Years 286 (9.7)	222 (77.6)	64 (22.4)	
≥45 Years 198 (6.7)	143 (72.2)	55 (27.8)	
Rank Groups (n=2974)			
Commissioned Officer 379 (12.7)	306 (80.7)	73 (19.3)	$\chi 2$=4.21 d.f. 3 p=0.24
SNCO (Sergeant and above) or Warrant Officer 588 (19.8)	444 (75.5)	144 (24.5)	
JNCO (Lance or Corporal Equivalent) 888 (29.9)	700 (78.8)	188 (21.2)	
Junior Rank 1119 (37.6)	869 (77.7)	250 (22.3)	
Role (n=2995)			
Combat 255 (8.6)	208 (81.6)	47 (18.4)	$\chi 2$=3.30 d.f. 2 p=0.19
Combat Support Arm 311 (10.5)	234 (75.2)	77 (24.8)	
Combat Service Support Arm 2389 (80.8)	1870 (78.3)	519 (21.7)	
Service Length (Grouped in Years) (n=2597)			
1-4 Years 793 (30.7)	624 (78.7)	169 (21.3)	$\chi 2$=4.53 d.f. 4 p=0.34
5-9 Years 657 (25.5)	523 (79.6)	134 (20.4)	
10-14 Years 406 (15.7)	312 (76.8)	94 (23.2)	
15-22 Years 510 (19.8)	383 (75.1)	127 (24.9)	
23+ Years 213 (8.3)	161 (75.6)	52 (24.4)	
≥1 Previous Deployment (n=2979)			
No Previous Deployments 1799 (60.4)	1393 (77.4)	406 (22.6)	$\chi 2$=0.79 d.f. 1 p=0.37
One or More Previous Deployment 1180 (39.6)	930 (78.8)	250 (21.2)	
Deployed in Last Year (n=2490)			
Not Deployed in last Year 2163 (86.9)	1668 (77.1)	495 (22.9)	$\chi 2$=2.93 d.f. 1 p=0.09
Deployed 327 (13.1)	266 (81.3)	61 (18.7)	

Table 43. Clinical Management Characteristics and Short-term Occupational Fitness

Clinical Management Characteristic n (%)	Occupationally Fit	Occupationally Unfit	χ^2, d.f., *p*
Intervention Type (n=2895)			
Assessment and Advice 936 (32.3)	761 (81.3)	175 (18.7)	**χ^2=240.03 d.f. 2 *p*<0.001**
Psychological Intervention 1585 (54.7)	1338 (84.4)	247 (15.6)	
Medication 374 (12.9)	181 (48.4)	193 (51.6)	
Intervention Intensity (n=2896)			
Brief Intervention (1-6 sessions) 2391 (82.6)	1966 (82.2)	425 (17.8)	**χ^2=101.28 d.f. 2 *p*<0.001**
Intermediate (7-12 sessions) 287 (9.9)	187 (65.2)	100 (34.8)	
Prolonged (12 or more sessions) 218 (7.5)	128 (58.7)	90 (41.3)	
Multi-disciplinary Team Management (n=2979)			
Single Therapist 2369 (79.5)	1993 (84.1)	376 (15.9)	**χ^2=254.76 d.f. 1 p<0.001**
Multi-disciplinary Team Referral 610 (20.5)	330 (54.1)	280 (45.9)	
Referred Following DSH Attempt (n=2979)			
No 2798 (93.9)	2208 (78.9)	590 (21.1)	**χ^2=23.41 d.f. 1 p<0.001**
Yes 181 (6.1)	115 (63.5)	66 (36.5)	
Alcohol Use (Not Primary Diagnosis) Men (n=1794)			
Safe limits (≤21 Units per Week) 1384 (77.1)	1105 (79.8)	279 (20.2)	χ^2=1.05 d.f. 2 *p*=0.59
Hazardous (22-49 Units Week) 233 (13.0)	188 (80.7)	45 (19.3)	
Harmful (≥50 Units per Week) 177 (9.9)	136 (76.8)	41 (23.2)	
Alcohol Use (Not Primary Diagnosis) Women (n=696)			
Safe limits (≤14 Units per Week) 546 (78.4)	427 (78.2)	119 (21.8)	χ^2=0.54 d.f. 2 *p*=0.76
Hazardous (15-35 Units Week) 117 (16.8)	91 (77.8)	26 (22.2)	
Harmful (≥35 Units per Week) 33 (4.7)	24 (72.7)	9 (27.3)	
Clinical Diagnosis (n=2976)			
No Psychiatric Diagnosis Assigned 424 (14.2)	391 (92.2)	33 (7.8)	**χ^2=255.94 d.f. 7 *p*<0.001**
Mild Adjustment Disorder 152 (5.1)	141 (92.8)	11 (7.2)	
Moderate to Severe Adjustment Disorder 1105 (37.1)	938 (84.9)	167 (15.1)	
Alcohol Use Disorder (Not Primary Diagnosis) 168 (5.6)	136 (81.0)	32 (19.0)	
PTSD or Acute Stress Disorder 140 (4.7)	99 (70.7)	41 (29.3)	
Neurotic Spectrum Disorder 117 (3.9)	82 (70.1)	35 (29.9)	
Anxiety or Mood Disorder 840 (28.2)	523 (62.3)	317 (37.7)	
Psychotic Illness or Personality Disorder 30 (1.0)	12 (40.0)	18 (60.0)	
Mental Health Problem Co-Morbid With Alcohol Misuse(n=2616)			
Not Comorbid 2231 (85.3)	1789 (80.2)	442 (19.8)	χ^2=2.96 d.f. 1 *p*=0.09
Comorbid 385 (14.7)	294 (76.4)	91 (23.6)	
Past Episode of Deliberate Self-Harm (n=2979)			
No History of DSH 2618 (87.9)	2093 (79.9)	525 (20.1)	**χ^2=48.69 d.f. 1 *p*<0.001**
History of DSH 361 (12.1)	230 (63.7)	131 (36.3)	
Past Referral to Psychiatric Services (n=2797)			
No 1246 (44.5)	1030 (82.7)	216 (17.3)	**χ^2=29.57 d.f. 1 *p*<0.001**
Yes 1551 (55.5)	1149 (74.1)	402 (25.9)	

Occupational Fitness

Of the patients who attended for assessment following referral (n=2979), 78.0% (n=2323) were graded as fully deployable on completion of care (short-term occupational fitness). In the follow up group (n=1205), 62.8% (n=757) were graded as fully deployable at the point at which data linkage was performed (longer-term occupational fitness).

Short-term Occupational Fitness – Univariable Analyses

No socio-demographic characteristics were found to be significantly associated with short term occupational fitness (Table 42). In univariable analyses, predictors of reduced short-term occupational fitness upon completion of care included intervention type and intensity of intervention ($p<0.001$) where prolonged intervention and medication receipt were associated with poorer outcomes. Other significant factors associated with short-term occupational fitness included referral following an episode of DSH ($p<0.001$), clinical diagnosis ($p<0.001$), MDT management ($p<0.001$), past episode of DSH ($p<0.001$) and past referral to psychiatric services ($p<0.001$) (Table 43).

Long-term Occupational Fitness – Univariable Analyses

Of the socio-demographic and military characteristics included in the univariable analyses, only being in the Army ($p<0.001$) and female sex ($p<0.05$) predicted reduced long-term occupational fitness. Deploying in the year prior to referral was associated with a significantly reduced likelihood of experiencing longer-term reduced occupational fitness ($p<0.05$). Royal Navy were present in such small numbers (n=6) that a robust assessment of RN personnel was not possible (Table 44).

Table 44. Longer Term Occupational Fitness or Adverse Discharge and Socio Demographic Characteristics

Demographic Characteristic	Deployable	Non Deployable or Adverse Discharge	χ2, d.f., *p*
Service (n=1205)			
Royal Navy/Royal Marines 6 (0.5)	3 (50.0)	3 (50.0)	***χ2=12.14 d.f. 1 *p*<0.001**
Army 252 (20.9)	135 (53.4)	117 (46.6)	
Royal Air Force 947 (78.6)	619 (65.3)	328 (34.7)	
Sex (n=1205)			
Male 881 (73.1)	568 (65.5)	313 (34.5)	**χ2=5.13 d.f. 1 *p*<0.05**
Female 324 (26.9)	189 (58.4)	135 (41.6)	
Relationship Status (n=1177)			
In a Long-Term Relationship 578 (49.1)	362 (63.3)	216 (36.7)	χ2=0.00 d.f. 1 *p*=0.97
Not In a Long-Term Relationship 599 (50.9)	375 (63.4)	224 (36.6)	
Parental Status (n=1177)			
Not a Single Parent 1015 (86.2)	640 (63.8)	375 (36.2)	χ2=0.67 d.f. 1 *p*=0.51
Single Parent 162 (13.8)	97 (60.5)	65 (39.5)	
Age Group (in Years) (n=1198)			
17-19 Years 52 (4.3)	30 (59.7)	22 (40.4)	χ2=0.59 d.f. 6 *p*=0.74
20-24 Years 253 (21.1)	157 (62.9)	96 (37.1)	
25-29 Years 237 (19.8)	161 (68.7)	76 (31.3)	
30-34 Years 221 (18.4)	137 (62.9)	84 (37.1)	
35-39 Years 244 (20.4)	150 (61.8)	94 (38.3)	
40-44 Years 114 (9.5)	72 (63.2)	42 (36.8)	
≥45+ Years 77 (6.4)	48 (61.5)	32 (38.6)	
Rank Groups (n=1205)			
Commissioned Officer 144 (12.0)	102 (70.9)	42 (29.1)	χ2=2.39 d.f. 3 *p*<0.07
SNCO (Sergeant and above) or Warrant Officer 261 (21.7)	159 (61.6)	102 (38.4)	
JNCO (Lance or Corporal Equivalent) 375 (31.1)	221 (59.4)	154 (40.6)	
Junior Rank 425 (35.3)	275 (65.6)	150 (34.4)	
Role (n=1195)			
Combat 100 (8.4)	58 (59.8)	42 (40.2)	χ2=0.35 d.f. 2 *p*=0.70
Combat Support Arm 119 (10.0)	76 (64.3)	43 (35.7)	
Combat Service Support Arm 976 (81.7)	622 (64.1)	354 (35.9)	
Service Length (Grouped in Years) (n=1160)			
1-4 Years 322 (27.8)	206 (64.9)	116 (35.1)	χ2=0.71 d.f. 4 *p*=0.58
5-9 Years 318 (27.4)	209 (66.4)	109 (33.6)	
10-14 Years 179 (15.4)	120 (67.7)	59 (32.3)	
15-22 Years 251 (21.6)	152 (60.9)	99 (39.1)	
23+ Years 90 (7.8)	57 (62.7)	33 (37.3)	
≥1 Previous Deployment (n=1205)			
No Previous Deployments 663 (55.0)	416 (63.1)	247 (36.9)	χ2=0.11 d.f. 1 *p*=0.74
One or More Previous Deployment 542 (45.0)	341 (64.0)	201 (36.0)	
Deployed in Last Year (n=950)			
Not Deployed in last Year 814 (85.7)	495 (61.4)	319 (38.7)	**χ2=5.07 d.f. 1 *p*<0.05**
Deployed 136 (14.3)	96 (71.5)	40 (28.5)	

*For the difference between Army and RAF outcomes.

**Weighted percentages and un-weighted cell counts are shown.

In univariable analyses, of the clinical and intervention characteristics, intervention factors were significantly associated with outcome (p<0.001) with prolonged intervention predicting poorer outcome. In addition, MDT management (p<0.001), past history of deliberate self-harm (DSH) (p<0.05) and past history of referral to psychiatric services (p<0.001) predicted reduced long-term occupational fitness or administrative or medical discharge in the longer-term (Table 45).

Adjusted Model Outcomes - Short-Term Occupational Fitness

Following adjustment for confounding variables, several predictor variables were associated with short-term reduced occupational fitness. There was a significant main effect for intervention type (AOR 1.26 95% CI 1.02-1.55); when examined as a categorical variable, compared with assessment and advice, treatment with medication was associated with a significantly increased probability of reduced short-term occupational fitness (AOR 1.88 95% CI 1.25-2.83) and psychological intervention with a better short-term outcome (AOR 0.65 95% CI 0.48-0.88). Although there was no significant main effect for intensity of intervention (AOR 0.28 95% CI 0.91-1.37), when examined as a categorical variable, intermediate level intervention (AOR 1.55 95% CI 1.07-2.24) was associated with reduced short-term occupational fitness compared to brief intervention. There was a significant main effect for MDT discussion or management (AOR 3.85 95% CI 2.92-5.08), past history of DSH (AOR 1.53 95% CI 1.04-2.25) and past history of referral to psychiatric services (AOR 1.72 95% CI 1.37-2.17). There was a significant main effect for clinical diagnosis (AOR 1.23 95% CI 1.17-1.30); in adjusted multinomial regression, a number of diagnostic categories were significantly associated with short-term reduced occupational fitness, including moderate to severe adjustment disorder, psychotic illness or personality disorder (PD), PTSD or acute stress disorder, neurotic spectrum disorders and anxiety and mood

disorders. Of the non-psychotic, non-personality disorders, anxiety or mood disorder had the greatest adjusted odds of short-term reduced occupational fitness (AOR 5.21 95% CI 3.02-8.90) (Table 46).

Table 45. Intervention Characteristics and Longer-Term Occupational Fitness or Adverse Discharge

Intervention Characteristic n (%)	Deployable	Non Deployable or Adverse Discharge	$\chi 2$, d.f., p
Intervention Type (n=1160)			
Assessment and Advice 341 (29.4)	213 (63.1)	128 (36.9)	**$\chi 2$=8.27 d.f. 2 p<0.001**
Psychological Intervention 670 (57.8)	447 (67.3)	223 (32.7)	
Medication 149 (12.8)	72 (49.7)	77 (50.3)	
Intervention Intensity(n=1160)			
Brief Intervention (1-6 sessions) 938 (80.9)	603 (65.1)	335 (34.9)	$\chi 2$=2.04 d.f. 2 p=0.13
Intermediate (7-12 sessions) 128 (11.0)	78 (61.4)	50 (38.6)	
Prolonged (12 or more sessions) 94 (8.1)	51 (55.0)	43 (45.0)	
Referred Following DSH Attempt (n=1205)			
No 1141 (94.7)	723 (64.1)	418 (35.9)	$\chi 2$=3.30 d.f. 1 p=0.07
Yes 64 (5.3)	34 (52.7)	30 (47.3)	
Alcohol Use (Not Primary Diagnosis) Men (n=743)			
Safe limits (≤21 Units per Week) 580 (78.1)	368 (64.9)	212 (35.1)	$\chi 2$=0.68 d.f. 2 p=0.51
Hazardous (22-49 Units Week) 97 (13.1)	69 (70.4)	28 (29.6)	
Harmful (≥50 Units per Week) 66 (8.9)	44 (68.6)	22 (31.4)	
Alcohol Use (Not Primary Diagnosis) Women (n=274)			
Safe limits (≤14 Units per Week) 213 (77.7)	127 (59.8)	86 (40.2)	$\chi 2$=0.53 d.f. 2 p=0.59
Hazardous (15-35 Units Week) 47 (17.2)	25 (53.9)	22 (47.1)	
Harmful (≥35 Units per Week) 14 (5.1)	7 (50.1)	7 (48.9)	
Diagnostic Category (n=1203)			
No Psychiatric Diagnosis Assigned 147 (12.2)	92 (62.7)	55 (37.3)	$\chi 2$=1.11 d.f. 7 p=0.36
Mild Adjustment Disorder 60 (5.0)	38 (64.6)	22 (35.4)	
Moderate to Severe Adjustment Disorder 473 (39.3)	315 (67.2)	158 (32.8)	
Alcohol Use Disorder (Primary Diagnosis) 60 (5.0)	40 (67.4)	20 (32.6)	
PTSD or Acute Stress Disorder 69 (5.7)	41 (61.7)	28 (38.3)	
Neurotic Spectrum Disorder 61 (5.1)	35 (59.2)	26 (40.8)	
Anxiety or Mood Disorder 319 (26.5)	187 (59.1)	132 (40.9)	
Psychotic Illness or Personality Disorder 14 (1.2)	7 (48.5)	7 (51.5)	
Mental Health Problem Co-Morbid With Alcohol Misuse(n=1046)			
Not Comorbid 888 (84.9)	557 (63.7)	331 (36.3)	$\chi 2$=0.04 d.f. 1 p=0.84
Comorbid 158 (15.1)	100 (63.6)	58 (37.2)	
Multi-Disciplinary Team Management (n=1205)			
Single Therapist 967 (80.2)	632 (66.0)	335 (33.9)	**$\chi 2$=13.83 d.f. 1 p<0.001**
Multi-disciplinary Team Referral 238 (19.8)	125 (52.9)	113 (47.1)	
Past Episode of Deliberate Self-Harm (n=1205)			
No History of DSH 1058 (87.8)	676 (64.5)	382 (35.5)	**$\chi 2$=4.22 d.f. 1 p<0.05**
History of DSH 147 (12.2)	81 (55.7)	66 (44.3)	
Past Referral to Psychiatric Services (n=1126)			
No 622 (55.2)	417 (67.6)	205 (32.4)	**$\chi 2$=12.23 d.f. 1 p<0.001**
Yes 522 (44.7)	285 (57.4)	219 (42.6)	

Table 46. Predictors of Short-Term Fitness– Unadjusted and Adjusted Odds Ratios and 95% Confidence Intervals

Short-Term Occupational Outcomes	OR	AOR[1]	AOR[2]	AOR[3]	AOR[4]
Intervention Type (n=2895)					
Assessment and Advice 936 (32.3)	1	1	1	1	1
Psychological Intervention 1585 (54.7)	**0.81 (0.65-0.99)**	**0.74 (0.58-0.95)**	0.80 (0.63-1.01)	**0.74 (0.58-0.95)**	**0.65 (0.48-0.88)**
Medication 374 (12.9)	**4.64 (3.57-6.02)**	**4.49 (3.35-6.01)**	**4.56 (3.41-6.09)**	**1.98 (1.42-2.77)**	**1.88 (1.25-2.83)**
Intervention Intensity (n=2896)					
Brief Intervention (1-6 sessions) 2391 (82.6)	1	1	1	1	1
Intermediate (7-12 sessions) 287 (9.9)	**2.47 (1.90-3.22)**	**2.57 (1.93-3.42)**	**2.43 (1.81-3.25)**	**1.50 (1.10-2.05)**	**1.55 (1.07-2.24)**
Prolonged (12 or more sessions) 218 (7.5)	**3.25 (2.44-4.34)**	**3.43 (2.50-4.71)**	**3.06 (2.22-4.22)**	1.12 (0.78-1.60)	1.11 (0.72-1.71)
Referred Following DSH Attempt (n=2979)					
No 2798 (93.9)	1	1	1	1	1
Yes 181 (6.1)	**2.15 (1.57-2.95)**	**2.18 (1.52-3.12)**	**2.08 (1.48-2.93)**	1.53 (0.99-2.36)	1.54 (0.92-2.58)
***Clinical Diagnosis** (n=2976)					
No Psychiatric Diagnosis Assigned 424 (14.2)	1	1	1	1	1
Mild Adjustment Disorder 152 (5.1)	0.92 (0.46-1.88)	0.69 (0.29-1.64)	1.04 (0.51-2.15)	1.03 (0.48-2.18)	0.79 (0.31-1.98)
Moderate to Severe Adjustment Disorder 1105 (37.1)	**2.11 (1.43-3.12)**	**2.11 (1.38-3.24)**	**2.06 (1.36-3.13)**	**2.01 (1.28-3.15)**	**2.02 (1.20-3.44)**
Alcohol Use Disorder (Not Primary Diagnosis) 168 (5.6)	**2.79 (1.65-4.71)**	**2.84 (1.61-5.00)**	**2.47 (1.40-4.35)**	**2.13 (1.15-4.06)**	2.08 (0.97-4.45)
Psychotic Illness or Personality Disorder 30 (1.0)	**17.77 (7.90-40.04)**	**13.09 (5.45-31.44)**	**13.08 (5.39-31.75)**	**10.09 (3.97-25.64)**	**5.42 (1.84-15.92)**
PTSD or Acute Stress Disorder 140 (4.7)	**4.91 (2.95-8.16)**	**4.77 (2.73-8.33)**	**3.94 (2.18-7.12)**	**4.59 (2.56-8.25)**	**2.76 (1.26-6.08)**
Neurotic Spectrum Disorder 117 (3.9)	**5.06 (2.97-8.61)**	**5.26(2.91-9.52)**	**4.70 (2.67-8.30)**	**3.56 (1.92-6.60)**	**3.33 (1.59-6.97)**
Anxiety or Mood Disorder 840 (28.2)	**7.18 (4.90-10.52)**	**7.14 (4.68-10.89)**	**6.90 (4.60-10.36)**	**5.49 (3.48-8.66)**	**5.21 (3.02-8.90)**
Multi-Disciplinary Team Management(n=2979)					
Single Therapist 2369 (79.5)	1	1	1	1	1
Multi-disciplinary Team Referral 610 (20.5)	**4.50 (3.71-5.46)**	**4.77 (3.84-5.94)**	**4.18 (3.37-5.18)**	**4.96 (4.05-6.09)**	**3.85 (2.92-5.08)**
Past Episode of Deliberate Self-Harm (n=2979)					
No History of DSH 2618 (87.9)	1	1	1	1	1
History of DSH 361 (12.1)	**2.12 (1.66-3.71)**	**2.24 (1.72-2.91)**	**2.22 (1.71-2.87)**	**1.77 (1.28-2.46)**	**1.53 (1.04-2.25)**
Lifetime Referral to Psychiatric Services (n=2797)					
No 1246 (44.5)	1	1	1	1	1
Yes 1551 (55.5)	**1.67 (1.39-2.00)**	**1.72 (1.41-2.11)**	**1.74 (1.41-2.14)**	**1.22 (1.00-1.50)**	**1.72 (1.37-2.17)**

AOR[1] Adjusted for Demographic Factors, including, for Service, Engagement Type, Sex, Relationship Status, Single Parent Status, Age group in years, Rank, Service Length group.
AOR[2] Adjusted for Operational Factors, including Combat Arm, Previous Operational Deployment, Deployed in the Last Year.
AOR[3] Adjusted for Clinical Factors, including, Illness Category, Intervention Type, Level of Intervention, Alcohol Use, History of DSH, Referral Following DSH, Past Referral to Psychiatric Services, MDT Discussion or Management
AOR[4] Adjusted for All Factors.
*AOR for Clinical Diagnosis entered as a dichotomous variable (Diagnosis assigned or not) AOR 1.23 (95% CI 1.17-1.30)

Adjusted Model Outcomes - Longer-Term Occupational Fitness and Occupational or Administrative Discharge

For longer-term reduced occupational fitness or adverse discharge, following adjustment for a range of confounding variables, being in the Army (AOR 1.71 95% CI 1.10-2.67) and MDT discussion or management (AOR 1.64 95% CI 1.05-2.59) were both associated with longer-term reduced occupational fitness or adverse discharge from service. Deployment in the year prior to referral was associated with a reduced adjusted odds of negative occupational outcome (AOR 0.50 95% CI 0.28-0.87), though this was borderline non-significant when adjusted for clinical factors. Sex was associated with longer-term reduced occupational fitness or adverse discharge (AOR 1.60 95% CI 1.10-2.34), though adjustment for clinical factors rendered the association borderline non-significant (Table 47).

Short-term Outcomes – Interactions

MDT discussion or management had the largest adjusted odds ratio for reduced occupational fitness on completion of care and was also significantly associated with longer-term reduced occupational fitness or discharge. It was hypothesised that more complex cases were managed by the multidisciplinary team and case complexity was associated with longer-term outcome. For short-term occupational fitness, interaction terms were created for MDT discussion and management and factors thought to represent clinical complexity. These were, 1. intervention type, 2. intervention intensity, 3. past episode of deliberate self-harm, 4. past psychiatric referral 5. diagnosis assigned or not, 6. current episode of DSH and 7. comorbidity with alcohol misuse. Following adjustment for clinical factors found to be significant in univariable analyses, all interaction terms were significantly associated with short-term occupational outcome (Table 48). For longer-term outcomes, interaction terms

were created using the same process. Following adjustment for potential confounding variables that were significant in univariable analyses, MDT discussion and management had a significant interaction with intervention type, intervention intensity, past referral to psychiatric services, assigned diagnosis or not and co-morbidity with alcohol. It was therefore concluded that the complexity of clinical presentation, represented by a range of clinical and therapeutic factors was associated with management by the MDT and was predictive of both short-term and longer-term reduced occupational fitness or discharge (Table 7).

Table 47. Predictors of Longer-Term Fitness or Adverse Discharge – Unadjusted and Adjusted Odds Ratios and 95% Confidence Intervals

Predictor Variable	Category	OR	AOR[1]	AOR[2]	AOR[3]	AOR[4]	AOR[5]
***Service** (n=1199)	Royal Air Force 947 (79.0)	1	1	1	1	1	1
	Army 252 (21.0)	**1.59 (1.32-1.90)**	**1.81 (1.32-2.47)**	**1.51 (1.05-2.17)**	**1.77 (1.27-2.46)**	**1.63 (1.23-2.17)**	**1.71 (1.10-2.67)**
Sex (n=1205)	Male 881 (73.1)	1	1	1	1	**1**	**1**
	Female 324 (26.9)	**1.35 (1.04-1.76)**	**1.64 (1.22-2.20)**	**1.44 (1.07-1.94)**	1.27 (0.93-1.72)	**1.35 (1.03-1.75)**	**1.60 (1.10-2.34)**
Rank Groups (n=1205)	Junior Rank 425 (35.3)	1	1	1	1	1	1
	JNCO (Lance or Corporal Equivalent) 375 (31.1)	**1.30 (1.00-1.74)**	1.20 (0.84-1.79)	**1.39 (1.00-1.94)**	**1.43 (1.02-2.00)**	1.31 (0.98-1.75)	1.36 (0.86-2.17)
	SNCO (Sergeant and above) or Warrant Officer 261 (21.7)	1.19 (0.86-1.64)	1.30 (0.68-1.72)	1.14 (0.78-1.66)	1.21 (0.83-1.77)	1.18 (0.85-1.63)	1.06 (0.54-2.10)
	Commissioned Officer 144 (12.0)	0.78 (0.52-1.18)	0.79 (0.54-1.87)	0.77 (0.48-1.25)	0.91 (0.57-1.44)	0.78 (0.52-1.87)	0.91(0.48-1.74)
Intervention Type (n=1160)	Assessment and Advice 341 (29.4)	1	1	1	1	1	1
	Psychological Intervention 670 (57.8)	0.83 (0.63-1.09)	0.82 (0.62-1.11)	0.83 (0.60-1.13)	0.89 (0.62-1.29)	0.83 (0.67-1.02)	0.89 (0.57-1.40)
	Medication 149 (12.8)	**1.73 (1.17-2.57)**	**1.22 (1.17-2.72)**	**1.86 (1.19-2.91)**	1.48 (0.86-2.55)	**1.82 (1.35-2.47)**	1.79 (0.91-3.53)
Intervention Intensity (n=1160)	Brief Intervention (1-6 sessions) 938 (80.9)	**1**	**1**	1	1	1	**1**
	Intermediate (7-12 sessions) 128 (11.0)	1.17 (0.80-1.72)	1.09(0.73-1.63)	1.07 (0.69-1.65)	0.91 (0.60-1.40)	1.15 (0.78-1.70)	0.75 (0.44-1.26)
	Prolonged (12 or more sessions) 94 (8.1)	**1.52 (1.00-2.34)**	**1**.51 (0.95-2.40)	1.35 (0.83-2.20)	0.94 (0.56-1.59)	1.50 (0.98-2.31)	0.71 (0.38-1.35)
Alcohol Use Men (n=743)	Safe limits (≤21 Units per Week) 580 (78.1)	**1**	1	1	1	1	**1**
	Hazardous (22-49 Units Week) 97 (13.1)	0.78 (0.48-1.25)	0.84 (0.50-1.40)	0.79 (0.45-1.37)	0.82 (0.46-1.46)	0.77 (0.48-1.24)	0.76 (0.38-1.51)
	Harmful (≥50 Units per Week) 66 (8.9)	0.85 (0.49-1.47)	0.74 (0.41-1.34)	0.93 (0.50-1.76)	1.07 (0.38-3.06)	0.86 (0.49-1.50)	0.50 (0.13-1.96)
Multi-Disciplinary Team Referral (n=1205)	Single Therapist 967 (80.2)	1	1	1	1	1	1
	Multi-disciplinary Team Referral 238 (19.8)	**1.73 (1.29-2.32)**	**1.73 (1.27-2.35)**	**1.78 (1.28-2.47)**	**1.54 (1.06-2.23)**	**1.70 (1.27-2.28)**	**1.64 (1.05-2.59)**
Past Episode of Deliberate Self-Harm (n=1205)	No History of DSH 1058 (87.8)	1	1	1	1	1	1
	History of DSH 147 (12.2)	1**.45 (1.02-2.06)**	**1.46 (1.00-2.12**)	1.26 (0.85-1.88)	1.13 (0.71-1.80)	**1.47 (1.03-2.01)**	1.17 (0.68-2.02)
Past Referral to Psychiatric Services (n=1126)	No 622 (55.2)	1	1	1	1	1	1
	Yes 504 (44.8)	**1.55 (1.21-1.98)**	1**.44 (1.11-1.88)**	1**.58 (1.19-2.10)**	1**.43 (1.09-1.88)**	**1.52 (1.18-1.96)**	1.27 (0.89-1.79)
Deployed in the Year Prior to Referral (n=950)	Not Deployed 814 (85.7)	1	1	1	1	1	**1**
	Deployed 136 (14.3)	**0.63 (0.42-0.95)**	**0.61 (0.40-0.93)**	**0.43 (0.26-0.72)**	0.69 (0.45-1.05)	**0.64 (0.42-0.95)**	**0.50 (0.28-0.87)**

* Limited data were available for Royal Navy personnel (n=6) - these were therefore dropped from the between-Service comparison. RAF rate of negative occupational outcome 34.6% (n=328), Army 46.4 (n=117).
AOR[1] Adjusted for Demographic Factors, including, for Service, Sex, Relationship Status, Single Parent Status, Age group in years, Rank, Service Length group. Engagement type (Reserves n=19) was not included as a potential confounder due to small numbers.
AOR[2] Adjusted for Operational Factors, including Combat Arm, Previous Operational Deployment, Deployed in the Last Year.
AOR[3] Adjusted for Clinical Factors, including, Diagnosis assigned or not, Intervention Type, Level of Intervention, Alcohol Use, History of DSH, Referral Following DSH, Past Referral to Psychiatric Services, MDT Discussion or Management.
AOR[4] Adjusted for Time Since Referral.
AOR[5] Adjusted for All Factors.

Table 48. Interaction Terms and Occupational Fitness – Unadjusted and Adjusted Odds Ratios and 95% Confidence Intervals

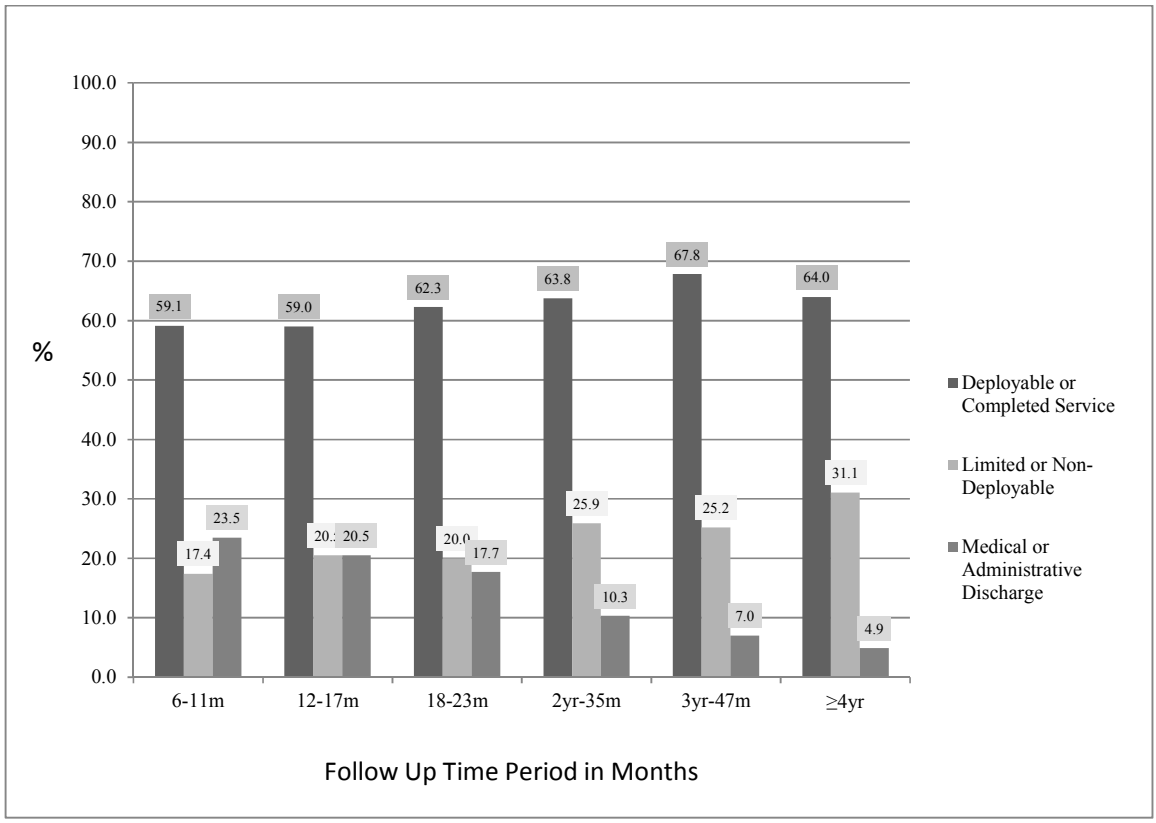
Interaction Term	Short-Term Occupational Outcome		Long-Term Occupational Outcomes	
	OR	AOR[1]	OR	AOR[2]
Multi-disciplinary Team Management x Intervention Type	**2.19 (1.94-2.47)**	***1.90 (1.71-2.11)**	**1.34 (1.17-1.53)**	***1.30 (1.11-1.53)**
Multi-disciplinary Team Management x Intervention Intensity	**1.53 (1.40-1.69)**	****1.92 (1.67-2.22)**	**1.44 (1.22-1.70)**	**1.32 (1.08-1.62)**
Multi-disciplinary Team Management x Past Episode of DSH	**3.89 (2.61- 5.78)**	*****2.62 (1.58-4.37)**	**1.98 (1.03-3.80)**	*****1.27 (0.63-5.59)**
Multi-disciplinary Team Management x Past Psychiatric Referral	**1.35 (1.11-1.65)**	******1.50(1.17-1.92)**	**1.78 (1.23-2.58)**	******1.61 (1.06-2.46)**
Multi-disciplinary Team Management x Diagnosis Assigned or Not	**4.99 (4.00-6.09)**	†**4.37 (3.48-5.48)**	**1.81 (1.34-2.45)**	**1.51 (1.05-2.19)**
Multi-disciplinary Team Management x Current Episode of DSH	**3.27 (1.90-5.65)**	#**2.31 (1.25-4.29)**	0.95 (0.34-2.69)	0.59 (0.19-1.85)
Multi-disciplinary Team Management x Alcohol Misuse Co-morbidity	**0.88 (0.84-0.93)**	‡**0.88 (0.83-0.92)**	**2.58 (1.35-4.94)**	**2.54 (1.19-5.40)**

AOR[1] - Adjusted for, Intervention Type, Intervention Intensity, Current Episode of DSH, Past History of DSH, Past Referral to Psychiatric Services, Diagnosis Assigned or Not
AOR[2] - Adjusted for Service Background, Sex, Deployed in the Last Year, Intervention Type, Past History of DSH, Past Referral to Psychiatric Services
*Not adjusted for Intervention Type
**Not adjusted for Intervention Intensity
*** Not adjusted for Past Episode of DSH
****Not adjusted for Past Referral to Psychiatric Services
†Not adjusted for Diagnosis Assigned or Not
Not adjusted for Current Episode of DSH
‡ Not adjusted for Co-morbidity with Alcohol

Trends over Time

The rate of full occupational fitness rose from a rate of 59.1% in the nine to eleven month period following discharge from the DCMH to a peak of 67.8% during the period of three to four years post discharge (Figure. 8); the trend over time was not statistically significant (χ^2 test for trend =2.27, p=0.13). Medical or administrative discharge was highest in the early period of measurement (23.5%) and fell consistently over the follow up period to around 5% at four or more years post discharge; the downward trend was statistically significant (χ^2 test for trend =5.25, p<0.05). Rates of medical downgrading rose consistently over time from 17.4% in the early period of measurement to 31.1% in the four year plus follow-up period; this trend was statistically significant (χ^2 test for trend =37.39, p<0.001).

Figure 8. Longer-term Occupational Fitness and Adverse Discharge among DCMH Patients



Main Findings

This study examined short and longer-term occupational fitness among UK Service personnel treated for a range of mental health disorders in a military department of community mental health. The first study hypothesis tested that clinical intervention delivered by military mental health services would return at least three quarters of personnel referred with mental health problems to work with no medical restrictions. This hypothesis was fully supported. The second hypothesis was that mental health treatment delivered by military clinicians in a

non-deployed setting would promote long-term occupational fitness for role in around 80% of personnel. This hypothesis was not supported; occupational fitness rates, including medical discharge, rose consistently and significantly over time after contact with the DCMH ended, affecting around a third of personnel during the follow up period from six months to nine years after completion of care. The likelihood of medical or administrative discharge was highest soon after completion of the care episode then reduced consistently and significantly over time.

The secondary objective of this study was to describe the predictors of both short and longer-term occupational fitness following discharge from military mental healthcare. Patients in receipt of psychoactive medication had poorer short-term occupational fitness rates than those who were assessed, provided with advice but not engaged in ongoing care; those who received psychological intervention had better short-term occupational outcomes than assessment only cases. Multi-disciplinary team management, past episodes of deliberate self-harm and past psychiatric referral or care were all significantly associated with poorer short-term occupational fitness rates. Diagnosis was also significantly associated with short-term outcome with some diagnostic categories, particularly psychosis, personality disorder, anxiety and depression having the lowest short-term occupational fitness rates.

For longer-term occupational fitness, Army personnel and those who were managed by the multi-disciplinary team experienced poorer long-term occupational fitness as did personnel previously referred to or cared for by psychiatric services. There were insufficient numbers of RN/RM personnel in the follow-up sample to adequately assess outcome. Although intervention type was not associated with longer term occupational fitness or adverse discharge, there was some evidence, although inconclusive, that those in receipt of

medication had poorer outcomes than either those who were assessed and given advice but not ongoing care or those in receipt of psychological intervention. A fifth of both men and women consumed hazardous or harmful amounts of alcohol; 15% had mental disorders co-morbid with alcohol though neither alcohol consumption level nor co-morbidity predicted short or longer-term occupational fitness.

CHAPTER 11 – DISCUSSION – MAIN THESIS FINDINGS

Overview

Through a series of related investigations, this thesis explored three levels of prevention activity related to military mental health as currently practiced within the UK Armed Forces across all phases of the deployment cycle. The following discussion reviews the main findings which will endeavour to set out a narrative account of how each study area relates to the three levels of prevention and how these in turn might influence and support military mental health. Within the context of military mental health, suggestions will be made about how potential sources of mental health support can be exploited. Where significant study design flaws exist, adaptations to the methodology will be suggested that might improve future evaluations, and finally, potential future areas of research will be proposed. Summary recommendations are shown at the end of the discussion.

Primary Prevention - The R&R Study

R&R was the first element of primary prevention to be investigated. One major caveat should be born in mind when interpreting the results of the R&R study and other thesis components in relation to levels of prevention. Among UK Armed Forces personnel, given the sometimes stressful nature of military life, high levels of hardiness and moderately low levels of poor mental health are relatively common, particularly during deployment. As a result, opportunities to demonstrate the effectiveness of primary prevention, and secondary prevention in particular are somewhat limited as the margins for improvement related to primary preventative activity and opportunities for secondary detection are comparatively small.

Mental Health Outcomes

The rates of PTSD found in the R&R study are overall in keeping with those found among European, Canadian and Australian forces personnel, but are substantially lower than the majority of US forces published rates (Sundin et al., 2010) and are at the lower end of estimates for rates in non-US population studies (Nugent et al., 2013). Relatively low levels of both CMD and PTSD were found despite participants reporting high levels of recent combat exposure. The picture for alcohol use is less positive. Around half of the study respondents reported that they drank hazardously in the year before they deployed and those surveyed on completion of R&R reported that they had consumed alcohol at potentially hazardous levels while they were at home. Overall, levels of historical hazardous alcohol use and alcohol misuse at this level during R&R were similar, however, more extensive combat exposure was associated with greater levels of potentially hazardous alcohol use. Linked to the latter was the finding that the cumulative effects of having spent more time in the operational area prior to R&R was associated with lower levels of satisfaction with R&R. Those who spent longer in the operational area prior to R&R reported significantly greater exposure to combat events and also significantly more functional impairment arising from mental health symptoms. It is perhaps understandable that combat fatigue might have impaired the ability to engage with R&R since previous research has demonstrated a significant link between self-reported combat stress and current mental health symptoms (Riddle et al., 2008). It might also explain why some personnel reinstated their alcohol use so rapidly during the brief period spent at home as they misguidedly sought to improve their state of mind. It is unfortunate for two reasons, firstly combat fatigue and associated stress reactions may be predictive of poorer medium term mental health (Isserlin et al., 2008) and would therefore potentially benefit from primary prevention and secondly, R&R appears to

be less recuperative for those with greater operational exposure, the very group that R&R seeks to help the most.

The Relationship of R&R to Mental Health

Taking a period of R&R during deployment appeared to have no overall significant positive impact upon mental health upon return to deployment, this may have been related to the study design. Only a small number of personnel completed pre and post-R&R measures and the absence of any substantial impact upon mental health may have been related to between-subjects and between-sample group differences rather than R&R not having any mental health promotion effects as such. To robustly assess the impact of R&R, it would of course have been preferable to conduct a randomised controlled trial to minimise the effect of potential sources of bias. Withholding a welfare-based process in the control arm of the study would have been difficult to achieve as operational commanders and perhaps ethical committees would not have allowed such a study to take place. Although it would be subject to some level of bias, it might be helpful to repeat the study in its current form using a strict within-subjects pre/post evaluation. Any study of this kind would benefit from a longer-term follow-up element to assess whether any initial psychological impact was maintained. The follow-up assessment could take place at the end of deployment, perhaps during decompression, to avoid the additional potential confounding effects of the post-deployment normalisation process and the positive mental health impact of returning home safely at the end of an arduous deployment.

Satisfaction with R&R

R&R was reportedly highly satisfying for at least 90% of respondents. The satisfaction levels associated with the experience of R&R concord with the high levels reported in other operational mental health studies (Mulligan et al., 2010; Jones et al., 2011; Mulligan et al., 2010; Fertout et al., 2012). An indicator of the popularity of R&R was the finding that the majority of respondents would value R&R during future deployments and that it met their personal needs in relation to the current deployment. Although taking R&R did not appear to have a positive mental health impact, the study results suggest that R&R is primarily an opportunity to rest and psychologically re-set; the high levels of endorsement of the aspects of R&R-related to social support and relaxation suggest that the majority of personnel may have experienced just such an outcome. Although it seemed that R&R did not influence levels of mental health symptoms or the extent of alcohol use during R&R, personnel who were able to engage with some of the components of R&R reported better mental health and less hazardous alcohol use. Given the cross sectional nature of the data, it was not possible to say whether better mental health and lower levels of hazardous alcohol use influenced the ability to engage with and derive satisfaction from R&R or if engagement promoted better mental health. Despite these limitations, it is tentatively suggested that it might be helpful to prepare personnel to make the most of R&R through written or video-delivered educational material or verbal advice given prior to leaving the operational area to ensure that they are in the best possible position to actively engage with R&R.

Mental Health and the Components of R&R

There were differential levels of association of mental health with the various sub-components of R&R. Greater satisfaction with travel was associated with lower rates of hazardous alcohol use during R&R. It has been previously reported that travelling to and from Afghanistan is somewhat complex, the airbridge can sometimes be fragile and as a consequence, frustration with travel is substantial among UK military personnel (Burdett et al., 2011). Furthermore, at the time that this study was conducted, the need to prioritise transportation for casualties out of the operational area may have resulted in areas of the aircraft being converted for use as a casualty treatment and transfer area, which may have disrupted scheduled air travel. The complexity of organising air transport during combat operations means that personnel can sometimes spend long periods in passenger holding areas or be taken off a flight at a waypoint on the return home. The collective effect of these factors may, therefore, have resulted in travel fatigue and possibly a frustrated state of mind for some when touching down in the UK. It is possible that personnel may have attempted to mitigate these effects by using alcohol as a soporific or anxiolytic agent. As noted in the introduction to this study, the findings regarding travel and its potential impact upon mental health is consistent with the civilian literature. The mental health impact of adverse travel arrangements adds further impetus to the considerable efforts being made to improve transport to and from the operational area. It might be useful to examine whether allowing personnel to take a brief period of rest before boarding the aircraft, without shortening the duration of R&R, could improve engagement and possibly reduce the use of alcohol during R&R.

R&R, Operational Exposure and Social Support

Although PTSD rates appeared to be unaffected by R&R, individuals who had experienced a greater frequency of thoughts of impending death and injury (which constitutes exposure to a potentially traumatic event, a necessary component of the PTSD diagnostic criterion A) reported significantly greater satisfaction with R&R as they returned to the operational area. R&R may have been an opportunity to access social support during which concerns about death and injury could be worked through in a physically and psychologically safe environment. Indeed, among the six items constituting the individual elements of R&R which were endorsed by over 90.0% of personnel, three items were associated with relaxing and taking a break from physical demands and a cluster of three factors signified being with, feeling close to and gaining support from family and or friends. Whilst communication with home support is possible during deployment, there is no evidence to suggest that such support is particularly helpful to deployment mental health (Greene et al., 2010); face to face contact during R&R may therefore fulfil a social support function. Further evidence for the importance of the social support elements of R&R is the finding that personnel in long-term relationships derived significantly greater satisfaction from R&R than single or unattached personnel. Furthermore, in addition to travel satisfaction, reporting greater levels disengagement from events in Afghanistan appeared to be associated with a reduced probability of reporting hazardous alcohol use and better mental health outcomes, with the ability to relax also contributing to better mental health but not increased alcohol use.

R&R and Alcohol Use

As reported previously (Jones and Fear, 2011; Rona et al., 2010), alcohol misuse is substantially more common amongst UK AF personnel than in matched civilian populations.

UK combat deployments are designated as 'dry', that is, no alcohol is provided for UK military personnel during their time in the operational area. This is primarily a safety measure, as all personnel are required to carry a weapon and many carry out safety-critical tasks while deployed. A significant number of those taking R&R appeared to reinstate pre-deployment drinking habits whereby levels of alcohol use quickly rose while personnel were at home and rapidly came to resemble the levels of historical use reported by those embarking on R&R. Personnel who completed longer periods of deployment prior to R&R were especially likely to escalate their drinking to hazardous levels. It is perhaps helpful to note that greater ability to cognitively disengage from Afghanistan appeared to be associated with lower levels of alcohol use and a strategy of limiting alcohol use during R&R should perhaps be encouraged among those completing longer periods of deployment prior to taking R&R. Given that alcohol misuse is likely to prevent engagement with R&R, influencing R&R drinking behaviour might be an important area for future research. It may be helpful to put in place a long term strategy as re-instatement of excessive alcohol use is likely to occur at the end of the operational deployment just as it does during R&R and may continue unchecked as personnel will not be subject to a return to enforced abstinence in the same way as those who have completed R&R.

R&R – Alternative Study Design

Personnel who agreed to take part in this study were about to return to the operational area after a brief period at home. The level of combat and operational exposure reported by study respondents was substantial and deployment for those so affected represented a significant and unavoidable stressor. Given that such exposure was so recent, levels of mental health disorder symptoms were low. The anticipation of further combat and operational exposure

among time two respondents about return to the operational area may well have accounted for the lack of difference in mental health disorder symptoms pre- and post-R&R. Although small numbers completed the survey pre- and post-R&R, taking R&R did not appear to influence mental health symptoms irrespective of whether comparisons were made between subjects or within subjects using a matched sample approach. Although R&R represents a primary prevention approach which aims to minimise the potential adverse mental health consequences of deployment, it may be that focusing solely upon mental health when measuring possible R&R outcomes is not the most appropriate methodology and satisfaction alone may be an appropriate measure.

To avoid the difficulties associated with conducting the survey in the R&R arrival/departure area, any future study might use a survey pre-placed in the deployment area within the operational unit so that each person proceeding upon R&R could complete a mental health survey in the lead up to embarkation and could then be given a combined R&R experiences and mental health survey immediately upon return to the operational unit. Given that this would necessitate the use of named data to facilitate data linkage, special arrangements would need to be made to secure the data. If the hardware and connectivity were available in the operational area, and current arrangements suggest that this might well be the case during future deployments, one method of conducting such research would be to use a laptop-based survey with data stored on a secure server. Each person could be given a pseudo-anonymised login to protect anonymity. If the appropriate supporting technology was lacking, other options would include installing a secure facility for the storage of paper-based surveys. Such a system was used to good effect in the OMHNE surveys described in this thesis. In this instance, the researcher would need to be able to deploy to the operational area in order

to input and secure survey data on a regular basis. With careful planning, either paper-based or electronic surveillance would be feasible.

Potential Future Study Foci

It may be that the provision of R&R, despite having the facilitation of psychological 'rest' as its main objective, might have little to do with improving mental health. In other thesis components, such as the OMHNE deployment survey, R&R was deemed to be useful by the majority of respondents at two separate survey points and personnel who reported that R&R was useful experienced a positive influence upon mental health both in the OMHNE surveys and in the R&R study. In addition to being a popular intervention, R&R may also have had a positive effect upon morale, in which case it would represent an important component of deployment mental health support when personnel found it both helpful and could engage with it. The impact of R&R on deployment morale could be assessed in future studies.

R&R – Alternative Delivery Models

Given that only one model of R&R is provided by the UK AF, survey respondents were not given the opportunity to make a comparison with an alternative form of R&R. There are a number of other ways that operational rest could be provided. US Forces have adapted their R&R arrangements over the recent period of deployment and the current provision is very different to those in place for UK Forces. The adapted process utilised by US Forces in Afghanistan is known as the "rest-in-place" programme which is located within brigade or regional areas of operation and is accessed by way of a four-day special liberty pass.

Previously, US personnel serving in Iraq and Afghanistan travelled out of operational areas to access a R&R pass programme in an area that provided numerous facilities including pool tables, rooms full of big screen televisions, swimming pools, miniature golf, a discothèque, trips to a shopping mall and deep sea fishing. To qualify for access, personnel were required to serve on prolonged tours, so that those serving shorter length tours, irrespective of the level of combat exposure, did not receive R&R passes. The revised arrangements were designed to facilitate rest and recuperation without leaving the operational area, thus maintaining operational efficiency, and to increase access for greater numbers of personnel (Stars and Stripes. 2012). Given that the current UK R&R study suggested that personnel who misused alcohol during the period at home were less able to engage with R&R and appeared to derive less benefit from the process, there may be some benefit to be gained by personnel with a propensity to misuse alcohol from attending a US styled 'rest in place' facility. Here their alcohol intake could be monitored and perhaps regulated. However, personnel who are perfectly able to regulate their alcohol intake and derive maximum benefit from R&R would potentially be penalised by adopting such a process.

UK military commanders sometimes suggest that providing R&R at home is logistically intensive, costly, reliant on an at best brittle route out of the deployment area and, although based on anecdotal report, that returning Service personnel have lost their 'operational edge' in that they are less effective in their operational role immediately post-R&R. The current study outcomes do not support this view as personnel returning to theatre had similar levels of functional impairment to those embarking on R&R. Historically, military forces have provided safe areas close to the operational zone in which personnel can periodically rest out of line before returning to combat or their operational duties. The provision of cyclical rest periods was motivated by the observation that prolonged involvement in combat operations

was a substantial predictor of exhaustion and subsequent psychological breakdown (Anderson, 2012). Certainly the timing of R&R seems crucial; respondents in the R&R survey who took their rest period at home later during deployment appeared to derive less benefit from the process. It is of course possible that they were experiencing poorer mental health having been in the operational area for a longer period. Providing R&R facilities close to the operational area might facilitate ease of access and flexibility in allowing personnel with greater levels of combat exhaustion to rest out of line; it would also help to minimise the potential impact of adverse travel experiences which were a substantial determinant of R&R satisfaction in the current survey. Although from an operational command perspective, 'rest in place' is probably easier to manage, it does not allow for the potentially beneficial social support aspects of R&R that can result from contact with the family during the period at home. Should rest in place be provided, it would require that facilities to contact home by mixed media channels be substantially expanded as this is may help offset some of the negative family effects of military separation if properly managed (Pincus et al., 2001). This is an important consideration as R&R-derived social support appeared to be helpful to many respondents in the R&R survey and it would be degraded or lost completely if a rest period were to be taken close to the deployment location. If a local rest model were to be adopted during future deployments, examining the social support component of the R&R survey and comparing it with a similar question embedded in a local rest survey would be a useful component of any future study. Within the local rest area model, leave at home could be reserved for those completing lengthy tours. The requirement to provide this for smaller numbers of personnel would allow for proper scheduling without the current problem of attempting to avoid 'bunching' of R&R, or the rest period being taken very early or late during the period of deployment when it is provided for all. For some personnel, spreading

R&R across the period of deployment often gives rise to being forced to grant very early or late periods of leave at home.

Primary Prevention - Third Location Decompression (TLD) Study

The second major component of primary prevention examined in this thesis was the brief period of structured immediate post-deployment rest known as Third Location Decompression (TLD).

TLD Study – Main Findings

The UK AF policy of providing TLD is intended to promote re-adjustment following operational deployment so that attendees experience a smoother transition than those returning directly to their home location. The outcome of the TLD study suggested that this may not have occurred. In previous studies of TLD (Burdett et al., 2011, Jones et al., 2010, Fertout et al., 2011), when assessing satisfaction and perceived utility, the majority of personnel found TLD useful upon completion; the study authors cautioned that there was no guarantee that perceived helpfulness would predict better re-adjustment; this comment appears warranted. Overall, TLD appeared to reduce the incidence of both PTSD and MPS and was also helpful in reducing overall levels of potentially harmful alcohol use.

TLD in Heavily Combat Exposed Personnel

The effects upon PTSD were apparent in those experiencing moderate levels of combat exposure and a positive effect upon general mental health was seen in those reporting low

levels of combat exposure. There is no clear explanation for the failure of a socially supportive intervention based upon the promotion of rest and readjustment should have a differential effect moderated by combat and operational exposure, although increased levels of combat exposure have been linked to the development of PTSD (Hoge et al., 2004). Intuitively, personnel reporting high levels of these experiences might potentially benefit from the opportunity to 'decompress' and begin the cognitive processing of difficult deployment experiences before returning home. The current study results suggest that those reporting moderate levels of combat exposure may have the most to gain from TLD attendance in terms of reduced levels of PTSD symptoms. It may therefore be that personnel with more PTSD symptoms in the highest exposure group may be limited in their ability to engage with the TLD process; this may relate to intrusive PTSD symptoms and associated impaired concentration which might impede engagement with specific TLD activities. For example, the mental health promotion briefing elements may have required active cognitive processes such as attention which may have been lacking in those preoccupied with traumatic stress symptoms. Personnel may also have found avoidance behaviour, another cardinal feature of PTSD, to be a problem, particularly with respect to social interaction; in contrast, the low exposure group may have found TLD less relevant as they had fewer symptoms. There was some evidence in previous TLD utility studies (Burdett et al., 2011) that the journey from the operational area to Cyprus was sometimes stressful and frequently subject to air transport delay. Fatigue arising from transport problems may have compounded the effects of traumatic stress symptoms, which are more common among combat exposed personnel. This might hinder the ability to process the briefing information and, crucially, to reduce engagement with the TLD process overall.

Commitment to TLD

In the previous study of subjective impressions of TLD (Jones et al., 2011), personnel sometimes viewed the process as an impediment to homecoming rather than an important transition. It is possible that this may have inhibited commitment to the process and reduced potential gains for some. Intuitively, one possible solution to this might be to adopt a nuanced approach to the psycho-educational elements of TLD where lower combat exposed military units receive standard forms of briefing and units subjected to greater levels of combat exposure receive a briefing which focuses on PTSD symptom management and treatment seeking. This message could be reinforced during the longer-term normalisation period conducted in the home garrison. The UK's post-deployment briefing was standardised in 2008 and it may well be that some personnel attending earlier TLD received less well formulated briefings which may have influenced some of the study findings.

TLD and Alcohol Use

Dealing with potentially harmful alcohol use is a major component of post-deployment psycho-educational briefs and alcohol use is managed in a controlled way during TLD with a view to demonstrating the effect it has after a prolonged period of abstinence. In the UK Battlemind study which is highly structured, interactive and has a skills acquisition component, (Mulligan et al., 2012), the Battlemind was superior to standard briefing in reducing binge drinking when this was measured some four to eight months after attendance at TLD. As a result of the trial, Battlemind elements have been incorporated in the UK AF's standard TLD briefing package and this may have contributed to reduced levels of alcohol misuse in those attending later evolutions of TLD.

TLD and Leadership

In earlier studies (Jones et al., 2012) it was demonstrated that leadership, morale and cohesion were strongly associated with good mental health. In the current study, TLD had a benefit over and above good leadership. When leadership was adjusted for in the regression analyses, TLD continued to have a significant effect for some groups; it is therefore suggested that TLD should form one important component of a suite of supportive post-deployment mental health support interventions that may enhance the positive mental health effects of good leadership.

Alternative TLD Models

The evaluation of the psychological effects of TLD took place when it was a mandatory component of deployment for all personnel and there were no alternative immediate post-deployment interventions with which to make comparisons. The current model of TLD assumes that it is necessary to provide an operational pause at the end of deployment so that personnel can psychologically re-set before their return home. There is considerable evidence that operational deployment increases the risk of poorer mental health for some but not all personnel (Smith et al., 2008). However, there is a lack of evidence relating to the effect of the immediate homecoming experience upon mental health. There is some limited evidence that returning from deployment can be difficult for some. Relationship turbulence has been found to be relatively common post-deployment (Knobloch and Theiss, 2012) and both life events occurring during the immediate post-deployment period and the characteristics of the recovery environment are thought to be potentially important determinants of longer-term mental health (Schlenger et al., 1992). Additionally, the risk of violent behaviour is increased among deployed UK military personnel who misuse alcohol or

develop symptoms of mental disorder (MacManus et al., 2012). The available research therefore suggests that, if provided, future decompression models may need to take account of a broad range of re-adjustment issues.

TLD Psycho-educational Components

The provision of early intervention in the form of psychological debriefing is controversial and of questionable benefit (Sijbrandij et al., 2006) as is the use of psycho-education-based approaches (Wessely et al., 2008). The current TLD provision contains a psycho-education component, however, this has not been tested against a control condition and, with the exception of the UK Battlemind briefing (Mulligan et al., 2012), the content of the briefing sessions were not empirically derived. In contrast to the results of a study of US post-deployment Battlemind (Adler et al., 2009), there was no positive mental health effect for the psycho-education component among those reporting higher levels of combat exposure. It may be that the content of the current post-deployment briefings delivered during TLD are relevant to all attendees but the timing of delivery is not optimal. Personnel experiencing physiological arousal related to combat experiences may benefit more from such briefings when they have returned to the UK mainland and have had a chance to recover in a safe environment before settling into non-deployed life. Psycho-education may, therefore, be more appropriately delivered to combat units later in the normalisation process where greater time can be allocated, additional strategies such as CBT or mindfulness approaches can perhaps be added and personnel have had an opportunity to begin processing potentially traumatic events. It may also be the case that combat units may benefit from briefings tailored to their operational experiences. Delaying any psycho-educational briefings would in this case have the additional benefit of building in time to formulate a mental health

management briefing which takes account of the nature of the individual unit's deployment, including any combat or particularly stressful experiences.

TLD was formulated partly out of the desire to ensure that the welfare needs of military personnel returning from deployment are catered for, but also out of fear that merely allowing personnel to embark on post-deployment leave could be seen as negligent if problems such as violence, alcohol misuse and mental breakdown were to be encountered. Despite being well-intentioned, the UK TLD model was not empirically derived and is but one among many models of decompression provided by coalition forces. Nonetheless, unlike heavily combat exposed personnel, those whose deployment experiences are less impactful or who do not experience substantial combat may benefit from TLD in its current form. It would therefore perhaps be unwise to abandon or modified TLD entirely as, although it appeared not to impact positively upon readjustment, it appeared to benefit the physical and mental health of many deployed personnel. The pause in UK medium scale combat operations taking place at the time of writing gives a timely opportunity to re-examine, re-design and trial alternative TLD models. It may be that the current UK TLD model is not the best approach to managing post-deployment transition and that coalition partner models should be considered when their research findings become available. It is worth noting, however, that no evidence was found in this research that the mental health briefs or attendance at TLD overall were harmful.

Primary and Secondary Healthcare During Deployment

During operational deployment, large military units break down into smaller teams that are often distributed over a wide geographical area. When this occurs, mental health support becomes the responsibility of local commanders who may or may not have access to

specialist psychological or welfare support. The OMHNE deployment study examined primary and secondary prevention related to mental health using data derived from two operational surveys of UK military personnel deployed to Afghanistan some 18 months apart.

There were a number of key findings; general mental health and mental health stigmatisation and perceived barriers to care levels were not significantly different at the two survey points despite the level of reported combat exposure having reduced significantly over time. In both samples, sub-threshold PTSD symptoms and associated functional impairment were more prevalent in forward areas. Direct operational mental health support in the form of memorable pre-deployment stress briefs, perceived good leadership and perceptions of good family support were associated with better mental health at both survey points, however, in both samples, those seeking help from both non-medical and medical sources were more likely to experience poorer mental health.

Stability of Mental Health and Psychological Support over Time

The substantially changed operational environment was expected to have an influence on mental health outcomes. OMHNE A1 was conducted during intense offensive combat operations whereas the A2 survey took place in a marginally more benign and static operational area. This was evidenced by a significant reduction in reported combat exposure, though the latter remained substantial; however, the A2 survey sampled a greater number of austere forward locations. The potential lack of operational, welfare and medical support in these locations could potentially have had a substantial influence upon mental health (Shigemura and Nomura, 2002). The results of the survey suggest that this may well have been the case for sub-threshold PTSD symptoms but not for common mental disorder. It is therefore important to ensure that personnel operating in more dangerous, isolated locations

for prolonged periods of time are properly supported and offered every opportunity to access help when and if they require it. Stable and relatively low levels of mental disorder were found in comparison to the outcomes of US deployed mental health surveys conducted under similar conditions (JMHAT 7, 2010) and those found in UK military population level surveys which included both deployed and non-deployed personnel (Sundin et al., 2010). Although psychological health was not significantly different between the two surveys, it continues the pattern of reduction from the rate reported in the first Iraq-based OMHNE survey. The 'healthy warrior' effect (Wilson et al., 2009), where those who are medically unfit and those lost from service through natural attrition do not deploy, may have accounted for a share of this effect in the context of ongoing operations. However, direct operational support may have contributed to improved mental health, such as the significant increase in the number of personnel who recalled a pre-deployment stress briefing and continued high levels of perceived good leadership. It is notable that, although higher levels of each of the components of morale were reported by personnel in the first survey, the proportion of personnel reporting the highest levels of morale had risen significantly at the second survey point which may have influenced the mental health outcomes to some degree.

Mental Health Stigmatisation During Deployment

The level of mental health stigmatisation and perceived barriers to care remained high between the two survey points despite considerable effort being made by UKAF to promote a positive view of mental health through a number of active strategies such as education, poster and media campaigns. The rate of mental disorder in those reporting mental health stigmatisation and perceived barriers to care is reportedly higher than in the non-stigmatised (Iversen et al., 2011) and it perhaps would have been more reassuring if stigma had reduced.

Despite the persistence of stigma, the study results suggest a mixed picture overall, since although help seeking from welfare sources had fallen significantly, medical help seeking had risen significantly. Previous research has observed that stigmatisation is substantially higher during deployment than when it is measured immediately post-deployment (Osorio et al., 2012) and the authors of the post-deployment study argued that although it may influence the decision to seek help, deployment stigma may help to reinforce operational hardiness. The promotion of hardiness through stigmatisation may, however, give rise to adverse operational consequences given that functional impairment arising from untreated sub-threshold PTSD symptoms may act to reduce operational effectiveness. Attempts to reduce stigma and promote help-seeking among personnel affected by such symptoms should continue so that personnel who may be functioning at a sub-optimal level can access help so that operational effectiveness has the best chance of being restored.

R&R Re-visited

As discussed in the previous section, R&R was popular among deployed personnel, however, although R&R was deemed useful by the majority of personnel at both survey points and had some influence upon mental health, the latter became borderline non-significant when all observable confounders were accounted for. The study findings therefore reflect the results of the R&R study.

Pre-Deployment Briefing

As discussed in the introduction, in the UK AF, stress and mental health education takes place at various stages of deployment. Although it was not tested as an individual component

of TLD, post-deployment psycho-education delivered at TLD may have had a positive effect upon mental health for some personnel. To test the effect of pre-deployment preparatory psycho-education delivered immediately prior to embarking upon operations, a single question embedded in the OMHNE survey asked whether personnel remembered receiving such a briefing. As noted in previous research (Greenberg et al., 2009; Mulligan et al., 2010) the OMHNE study results suggested that those who recalled receiving such a briefing had better mental health when potential confounding effects were adjusted for. What the current study appears to suggest is that a memorable stress briefing has a positive mental health effect, however, the research did not directly test the content of such a briefing. The rise in the proportion of personnel remembering pre-deployment stress briefings may reflect the primary preventative effort that has been invested by military commanders in supporting deployment mental health. The data also reveal continued high levels of perceived good leadership and it is likely that good leaders will ensure that reasonable quality pre-deployment stress briefs are delivered to their personnel so that they are in the best frame of mind to undertake the forthcoming deployment. Where psycho-education in the form of Stress Management Training (SMT) has been subjected to rigorous evaluation, the available research suggests that it has either no sustained effect (Sharpley et al., 2008) or marginal, positive effects (Deahl et al., 2002). The same is true for more specific forms of SMT, such as UK Battlemind training. However, there is currently only a limited amount of robust evidence to suggest that psycho-education confers any definitive positive advantage over and above good military leadership, fostering unit morale and promoting unit cohesion. Given that the provision of SMT is a mandatory element of the UK Armed Forces' approach to maintaining good mental health amongst its personnel and forms a discrete component of the UK Armed Forces Mental Health Plan (Pinder et al., 2010), the use of pre-deployment SMT should be further refined and investigated. This should include rigorous testing of its

component parts, which are currently standardised, and preferably a randomised controlled trial to assess the main psychological effects of receiving such an intervention.

Leadership and Mental Health

The low levels of mental disorder found in the OMHNE deployment surveys may have been in part due to the largely positive views of leadership and associated substantial levels of unit cohesion and morale. Although leadership is chiefly a primary preventative activity in the context of mental health, for instance, good leaders may well seek to ensure that their subordinates receive pre-deployment psycho-education and that unit members feel able to offer mental health support when required, there are links with secondary and even tertiary prevention measures. To ensure that their unit is in the best possible condition to deploy, effective leaders may have developed measures to make sure that they are adept at recognising psychological symptoms, for instance, by undertaking TRiM training (Whybrow et al., 2013). They may also contribute to the 'healthy warrior effect' (Larson et al., 2008) by encouraging personnel with substantial untreated psychological symptoms to seek help prior to deployment. As the non-deployed healthcare study results suggest, treatment prior to deployment may either improve symptomatic personnel's mental wellbeing, making them fit for deployment or the mental health practitioner will ensure that those receiving ongoing mental health interventions will be medically protected from deployment until the outcome of the intervention is known.

Measuring Leadership Components

It has been suggested that leadership style can impact mental health either positively or negatively and that it may play a significant role in military hardiness (Bartone, 2006). Most studies conducted to date, including the current study, used brief measures of leadership that rely upon subordinates responding to statements regarding a narrow range of leader behaviours. Such scales may not capture the true essence of leadership (Hackman and Wageman, 2007) which is thought to be complex and multi-dimensional (Walumbwa et al., 2008). It is difficult to be sure that the effect of leadership upon mental health is being robustly evaluated. This is particularly true of the individual components of leadership which may well have differential effects in the context of mental health support. For instance, if leaders are seen to 'embarrass unit members in front of others', which is one of the four items contained in the leadership scale, then it is unlikely that subordinates will feel sufficiently confident that reporting psychological symptoms will meet with a positive response. Furthermore, most study designs, including the current study, are cross-sectional, and it is difficult to adequately assess causality. Prevailing mental health might influence subordinate views of leadership whereas psychological factors may well influence the ability of the leader to lead effectively (Macik-Frey et al., 2009).

It seems that there is a pressing requirement to develop a robust and comprehensive measure of leadership. One of the key outcomes for those with substantial mental health symptoms is whether they can engage with helping services and, although multi-factorial, one of the major barriers to engaging with effective care is the presence of stigmatising beliefs about mental health and help-seeking (Cornish et al., 2014). Although there is some evidence that leaders can help to reduce the impact of stigma upon help-seeking, there is a requirement to understand the mechanism by which leadership achieves this effect. What may be needed is

a phased study that generates a meaningful leadership measure which could then be used to assess the effects of leadership upon mental health and stigma/BTC and help-seeking over time. Further studies of the primary and secondary prevention characteristics of leadership are certainly indicated as good leadership is arguably one of the most important enduring and modifiable military mental health support interventions.

Leadership and Secondary Prevention

Most UK military studies regularly find that good leadership is reported at high levels, however, in the non-deployed help seeking study, the chain of command was the least popular potential source of help for mental health problems but was among the most commonly utilised sources of support. Secondary prevention activity as a discrete component of leadership may need to centre on promoting the chain of command as caring and supportive toward those personnel with psychological symptoms while maintaining firm but fair discipline which is the bedrock of an effective military. The non-deployed help-seeking study results suggested specific help-seeking impediments to focus upon which leaders at all levels should be able to influence, these were; potential loss of trust, loss of confidence, embarrassment and being blamed by leaders. Leaders may be in a position to promote better mental health through their awareness of the influence of current psychological symptoms among their subordinates. In the post-deployment mental health stigmatisation and perceived barriers to care (stigma/BTC) and help-seeking study, stigma/BTC relating to fear of being treated differently and being seen as weak trebled in those personnel who were probable mental health disorder cases compared to mentally healthy personnel. The study findings suggested that concerns about potentially diminished military functioning and fears of a negative reception should a mental health problem be

declared appear to become more pertinent at the point when mental health is worsening. Leaders at all levels should seek to combat such beliefs at every opportunity in order to facilitate timely help-seeking among those subordinates suffering with untreated psychological symptoms.

Family Support During Deployment

In the OMHNE deployment surveys, perceptions that family support was in place and that it was delivered at a satisfactory level were associated with better mental health at both survey points. Previous studies have suggested that distress in the deployed person's family is an important target for deployment mental health support and supportive stress-reduction interventions have been shown to improve family resilience when they are delivered successfully (Lester et al., 2012). There is little evidence about the specific way in which family support impacts upon the deployed person's mental health, however, irrespective of the actual level of family support, the OMHNE-based deployment study asked about the deployed person's perceptions of support and the study findings suggest that any such efforts on the part of military commanders must be made visible to deployed personnel in order to be meaningful. Of course, in the current study, objective measures of family support would have been helpful to better understand whether poorer mental health was related to actual lack of support or whether the study finding was simply about perceived shortcomings in support which may have been subject to psychological bias. It may be crucial to fully understand how family support works as around 50.0% of personnel reported that family support was either lacking or absent. The most common complaint received from deployed personnel was that insufficient information about the deployment was transmitted to families by members of the unit that remained behind in the home base (termed the 'rear operations group' or 'ROG'). Future studies should attempt to quantify the level and nature of delivered

support through the inclusion of an objective measure of family support and a qualitative component exploring the experiences of deployed personnel's family members. The resulting data could be used to generate a specific family support measure which could be used in studies to evaluate family support in relation to the deployed person's mental health and compare actual support with the deployed person's perception of such support. Elements that might be important to assess further might include issues such as a lack of information for families about how the deployed military unit is faring, particularly for families living 'off-base', and whether non-married partnerships actually receive poorer levels of welfare and general support as is currently perceived by some deployed personnel. A useful way to examine the effect of family support would be to compare a group who have no contact with their families and friends while deployed, such as an operational Royal Navy submarine and land-based personnel deploying on a mature operation where communication with home may be substantial.

Welfare Support During Deployment

The OMHNE deployment survey assessed the effects of operational, welfare and medical support provision in a range of locations including more austere environments. The results of the survey suggested that a lack of access to welfare support was associated with greater levels of sub-threshold PTSD symptoms but not symptoms of common mental disorder. The mechanism by which welfare support may have influenced acute stress symptoms or whether poorer mental health may have impacted upon perceptions of available welfare support was unclear. Future studies should gather objective data regarding the levels of welfare support for personnel operating in more dangerous, isolated locations for prolonged periods of time and an in-depth evaluation of the components of welfare support that have a modulating

effect upon mental health should be established. This is an important consideration as poorer mental health was associated with greater functional impairment and in the context of operational effectiveness, will be of great interest to operational commanders.

Medical Support During Deployment

The results of the OMHNE study suggested that help-seeking on operations was associated with poorer mental health, irrespective of whether support was received from non-medical sources such as friends, commanders or other welfare sources, or from medical sources, including primary care facilities and the field hospital. The rates of reporting sick for medical reasons and admission to the field hospital both increased significantly from OMHNE A1 to A2, however, it is notable that the unit medical officer was the least popular source of mental health support in this survey. Mental health symptoms were more prevalent amongst those reporting sick and stigmatisation and perceived barriers to care affected those with mental health symptoms to a greater degree. A substantial proportion of deployed personnel may have been disinclined to seek help because of perceived psychological and physical barriers; it is therefore suggested that medical consultations are an important opportunity for primary prevention activity or for the detection of early symptoms (secondary prevention). Firstly, it would appear that some effort will need to be made to ensure that personnel view the medical officer and associated staff as potentially helpful and accessible sources of support for mental health symptoms and secondly, that general medical staff feel equipped to deal with personnel who present with psychological symptoms.

Secondary Prevention

Psychological Symptoms, Stigmatising Beliefs and Barriers to Care (Stigma/BTC)

As outlined in the introductory chapter, secondary prevention is mainly about establishing procedures and strategies that seek to detect and treat pre-clinical risk factors in order to control the progression of potential and actual disorders. As described in the introductory chapter, among the main impediments to the effective detection of mental ill-health and emerging symptoms is the influence of stigma/BTC. In both the OMHNE deployment survey and in the non-deployed help-seeking study, levels of stigma/BTC were substantial and were more intense among personnel with higher levels of mental disorder symptoms. A similar association between psychological symptoms and stigma/BTC was observed in the post-deployment study, however, stigma/BTC levels were substantially lower immediately following deployment than in the deployed and non-deployed setting.

The results of the post-deployment stigma/BTC study suggested a possible explanation for the differing levels of stigma/BTC found amongst those with and without caseness levels of psychological symptoms. Mental health stigmatisation is known to be ubiquitous (Forbes et al., 2013) and previous research suggests that stigma/BTC levels are relatively constant in any population (Pescosolido et al., 2010). All thesis components that measured stigma/BTC confirmed both of these findings, suggesting that military groups appear to harbour a consistent background pool of negative assumptions about the consequences of help-seeking when they are psychologically healthy which appear to become more prominent when psychological symptoms develop. This was illustrated by the post-deployment study finding that just under a third of psychologically healthy personnel and those not using alcohol at

harmful levels reported raised levels of stigma/BTC; however, stigma/BTC levels appeared to double in the presence of AMD caseness and were also significantly associated with alcohol misuse in the post-deployment stigma/BTC study.

Stigma/BTC, Symptoms and Problem Recognition

Although mental health symptoms appear to be drive help-seeking (Harpaz-Rotem et al., 2014), being aware of the need for additional support is also key. The results of the non-deployed help-seeking study suggested that when personnel acknowledged the presence of a psychosocial problem, they were more likely to have sought help, particularly when they were additionally experiencing higher levels of psychological symptoms. In both the non-deployed and post-deployment studies, there was some evidence that in relation to help-seeking, stigma/BTC may well operate independently of, or in addition to, problem recognition as, in the non-deployed study, seeking support for a subjective psycho-social problem (implying problem recognition) was not significantly associated with raised levels of stigma/BTC; however, stigma/BTC were significantly associated with the presence of mental health disorder symptoms. The study results suggested that stigma/BTC levels among help-seekers with subjective psycho-social problems were similar to symptom free non-help-seekers (the reference group) while symptomatic help-seekers reported significantly greater stigma/BTC than the reference group while the highest stigma/BTC levels were found amongst symptomatic personnel who had yet to seek help. It may well be that a proportion of the personnel in the post-deployment study may have simply failed to recognise symptoms requiring additional support. This is a problem noted elsewhere in the literature (Talebi et al., 2013), particularly in relation to anxiety disorders (Johnson and Coles, 2013); indeed it has been noted that mental health literacy in the UK is generally poor (Jorm, 2000). The non-

deployed help-seeking study results suggested that symptomatic personnel were more likely to report discriminatory thoughts related to mental ill-health. It therefore seems that a series of factors inter-relate in a complex way; problem recognition, psychological symptoms, stigma and potential discrimination all appear to play a part in the decision to seek help.

The Critical Role of Psychological Symptoms

In the post-deployment stigma and help-seeing study different levels of stigma/BTC were systematically linked to the presence or absence of probable mental disorder and alcohol misuse. Recognising the presence of a subjective psychosocial problem was not significantly associated with raised stigma/BTC, while experiencing AMD caseness was. In this case, although moderate background levels of stigma/BTC were present in the healthy and those with a psychosocial problem, AMD symptoms alone appeared to be necessary and sufficient for the highest levels of stigma/BTC to be present. Evidence for the importance of mental health symptoms included the finding that stigma/BTC levels fluctuated with changes in probable mental disorder caseness over time. New onset mental health caseness and remission were both associated with increases and reductions in stigma/BTC respectively.

Interest in Receiving Support

The results of the non-deployed help-seeking study suggested that, in addition to AMD symptoms, being interested in receiving help or support, whilst not actually seeking it, was associated with substantial levels of stigma/BTC. A similar outcome occurred in the post-deployment stigma/BTC study. Pre-contemplation has been shown to mediate help-seeking and attitudes to mental health support (Levant et al., 2013) and so, in order to encourage help seeking, it is possible that there may be some benefit in educating military personnel to recognise that increasing mental health symptoms, experiencing emotional or relationship stressors and being interested in receiving help are indicators that there may be some benefit in receiving mental health support. Anti-stigma campaigns tend to deliver their messages in a blanket fashion to all military personnel, therefore, a more targeted approach aimed at those with higher levels of psychological symptoms may be more appropriate.

Help-seeking and Fear of Medical Intervention

Across the studies that measured stigma/BTC, irrespective of where personnel were located in the deployment cycle, help-seekers were more likely than non-help-seekers to experience poorer mental health and higher levels of stigma/BTC. It may be that for some personnel, detection, and aspects of secondary prevention are in place; however, the study outcomes further suggested that many symptomatic personnel did not engage with potential help sources. Low levels of help-seeking are commensurate with the findings of international surveys of mental health support among military personnel (Sareen et al., 2007). The non-deployed help-seeking study results suggested that experiencing psychological symptoms does not necessarily result in help-seeking; around a fifth of asymptomatic personnel nevertheless sought help for a family, stressful or relationship problem. Previous studies

have reported a similarly complex association between perceiving a need for support, attitudes about mental health, and severity of symptoms (Mojtabai et al., 2011).

Low levels of spontaneous help-seeking represent a challenge to effective detection as those most in need may well experience the greatest psychological barriers to care. The results of the non-deployed help-seeking study revealed that, irrespective of symptom levels, there was a widely held view that psychological symptoms were undesirable, that effective mental health treatment was helpful, necessary and that resolving mental health problems required an effort of will on the part of the affected person. Such views seemed to coalesce in those who wanted help but who had yet to seek it. Previous research has indicated that the perceived utility of mental health services is a fundamental component in the decision to seek help (Bayer et al., 1997) while psychologically distressed people may actively avoid medical sources of help (Ye et al., 2013). In keeping with the findings of previous research (Greenberg et al., 2003), help-seeking personnel in both the OMHNE, non-deployed help-seeking and post-deployment studies were more likely to access non-medical rather than military medical sources. In the post-deployment stigma/BTC study where non-medical sources were accessed at double the rate of sources that included formal medical assistance. The help-seeking and stigma studies all give clues about why the rate of help-seeking from medical sources is low in that seeking help from formal military medical sources appeared to carry a perceived occupational risk. The post-deployment study results further suggested that personnel may have sought help from non-medical sources to help minimise stigmatisation and avoid a potentially negative occupational outcomes. Seeking help from non-medical sources was associated with significantly increased levels of stigma/BTC which could imply that stigma/BTC may have been associated with making a conscious choice to access this source of support rather than medical.

Stigma/BTC Reduction Strategies – Alternative Realistic Views of Mental Healthcare

Given the finding that stigma/BTC fluctuate with changing mental state, in relation to seeking support from formal medical sources, military personnel could be encouraged to view stigmatising beliefs as a series of thoughts rather than an objective reality. One potential way of promoting engagement with medical and mental health services could be through the provision of accurate information delivered by way of mixed media such as leaflets, education, unit information campaigns and video. Such public health strategies could include corrective information about the nature, function and effectiveness of military health services so that personnel are able to make more informed decisions about accessing medical services for mental health support. Restorative mental health management relies on the ability of the help provider to intervene effectively to reverse or arrest the development psychological symptoms. It could be argued that military medical personnel are well placed to deliver such an outcome. Authors have described the comprehensive high quality clinical services that are generally well positioned and resourced to deliver evidence based therapies that could return those with substantial mental health symptoms to full functioning and therefore mitigate any adverse career effects (McAllister, 2006). A substantial caveat is required which relates to the potential occupational risk associated with help-seeking in a military context. The tertiary prevention, non-deployed healthcare study suggested that, following mental healthcare, no occupational impairment will occur for around two thirds to three quarters of personnel, but for the remainder, there is a definite risk of reduced occupational functioning, including medical discharge from service. US research has also reported that fears about medically imposed restrictions can pose an actual threat by limiting deployment and restricting other work activities when help is sought (Seal et al., 2009). Anti-stigma presentations and interventions should ideally contain a sensitively phrased message to this effect and medical

personnel should be honest and open about the potential career impact of a mental health referral while emphasising the potential negative consequences of persisting at work with an untreated mental health problem. The post-deployment stigma/BTC study results suggested that stigma/BTC levels reduced significantly when psychological symptoms abated, reinforcing the notion that stigma/BTC are ideas rather than facts. Willing volunteers who have recovered from a mental ill-health episode may therefore be in a good position to reinforce such a message and to communicate the potential for positive occupational outcomes to occur following mental health treatment or therapy.

Mental Health Awareness and Training of Medical Providers

The finding that medical officers and their supporting staffs were the least utilised of all the available potential sources of support across the deployed and non-deployed settings suggests that there may well be scope for improving aspects of both secondary and tertiary prevention. The inclusion in any medical consultation of a simple question about mental health might go some way to increasing engagement with helping services. This would have to be couched in terms of a supportive, non-threatening enquiry as the people who it is intended to detect may well be experiencing heightened levels of mental disorder symptoms and associated stigma/BTC. This proposal implies a training requirement for allied health professionals and combat medical technicians/assistants who have a lower level of medical training compared with medical officers.

Stigma/BTC and the Effectiveness of Medical Help-Seeking

All studies carried out for this thesis made use of restrictive measures of stigma/BTC which mainly focus upon psychological barriers to mental healthcare. In future studies, the reason why symptomatic personnel choose to avoid potential sources of secondary prevention could make use of broader measures of stigma/BTC as they become available. This might include the way in which stigma/BTC might impact upon social inclusion within military units. Secondly, having argued for the importance of promoting engagement with formal medical sources, it may be important to assess whether such sources of support are indeed more effective in the context of mental health than informal sources such as friends, family, unit commanders and welfare support. Currently, this is unknown, however, if medical support proves to be the most effective source of secondary prevention, efforts will be required to establish how mental health interventions are best delivered in the primary care environment which constitutes the first point of contact for medical consultations.

Help-seeking from Non-Medical Sources of Support

Across the studies that assessed help-seeking, informal and non-medical sources of support were consistently more popular than formal medical support. When asked to consider their willingness to access help from a range of potential sources, non-deployed help-seeking study respondents stated that they were least willing to engage with an online therapist and the unit chain of command was also widely unpopular while friends and family were popular. Distrust of the chain of command corresponds with the most common stigmatising belief that unit leaders might treat a person differently should they declare a mental health problem. Furthermore, it is commensurate with the finding that those who reported greater levels of

stigma/BTC were significantly more likely to endorse that they might discriminate against others on the grounds of mental health and presumably might expect others to behave in a reciprocal fashion toward them. The post-deployment study results were also helpful in assessing why personnel might be distrustful of unit-based sources of help. The rank order of stigma/BTC components was consistent between the initial post-deployment assessment and follow-up where loss of military credibility and trust featured prominently. The rate of reporting a fear of being treated differently and being seen as weak trebled among personnel who endorsed mental health caseness compared to mentally healthy personnel. Given that changes in stigma/BTC mirrored changes in mental health, it may well be that concerns about potentially diminished military functioning became more pertinent as mental health deteriorated. It seems, however, that thoughts do not always translate into behaviour, as when help-seekers were asked about the sources of help that they had actually used, the unit chain of command was the second most frequently accessed source of support.

Currently, there is little available evidence to compare outcomes between formal medical or unit based non-medical sources of support for military mental health problems. Should non-medical sources of support prove to be effective, then two possible interventions fall out of this; firstly, training in the management of mental health conditions for commanders and unit welfare staffs and secondly, education for families and friends about how best to support a military person who asks for help for mental health issues. A pre- post-training comparative trial could helpfully test the effects of training by interviewing help-seekers before and after the introduction of the unit-based and family education respectively.

Stigma/BTC and the Military Chain of Command

In the non-deployed help-seeking study, respondents were aware that military mental health services were available and two thirds felt that their mental health would be supported by the military, however, they remained fearful of being treated differently by commanders and peers. It was therefore somewhat surprising that they were able to overcome their fears to seek support from the chain of command, which is very much in a position to adversely affect a military career, but can also be of great psychological benefit (Jones et al., 2012). Of course, it may be that disclosing a mental health problem to the chain of command did not happen by choice. In a civilian context individuals can simply supply their employer with a reason for short periods of sickness absence without consulting a doctor or by other forms of officially sanctioned absenteeism. Military personnel are closely supervised and concealing a mental health problem is difficult and self-certification or sickness absence sanctioned by a civilian medical practitioner is usually notified to the chain of command so that an absence management plan can be initiated. Whether help-seekers chose to access the chain of command or whether their mental help symptoms or functional impairment inadvertently brought them to the attention of their leaders is unclear. What is apparent is that the unit chain of command may be well placed to provide mental health support to those experiencing symptoms though, to encourage help-seeking, they may have to state overtly that they will act in the individual's best interest should they choose to come forward for help. Military commanders may also wish to consider that effective mental health treatment is available from military sources and accessing care may help to avoid that which symptomatic personnel most fear, namely sanctions arising from reduced effectiveness arising from an untreated mental health condition. Irrespective of whether the person had symptoms of CMD or PTSD, concerns about potential loss of trust, peers having reduced confidence in them, embarrassment and being blamed by their leaders if they sought help for a mental health

condition were commonplace. To maximise opportunities for detection and risk-reduction, secondary prevention activity may need to centre on promoting unit-based sources of help as caring and supportive. This is appears to be particularly important for those with psychological symptoms.

Stigma/BTC and Psycho-Education

Given that failure to recognise the requirement for additional support may be a crucial consideration when deciding whether to seek help. It is of course worth considering whether respondents may have been influenced by the wording of the questions in the survey. This could perhaps have been phrased more simply without reference to emotional, stressful, family or relationship problems; perhaps 'do you have a mental health problem?' could have been a more appropriate question, although responses could still have been prejudiced by having to accept that mental ill-health was present, interactions with stigma/BTC and so forth. This potential shortcoming notwithstanding, the study findings may suggest three possibilities for future stigma/BTC interventions. Despite their variable impact, described in the introductory chapter, education-based approaches could seek to promote symptom recognition, target the symptomatic and describe the route to the restoration of military functioning and better mental health. There is a pressing need to assess the impact of education-based approaches to stigma reduction and to unpack the components of such campaigns that have the greatest psychological impact.

Timing of Stigma/BTC-reduction Interventions

Given that increases in stigma/BTC appeared to be associated with increases in overall levels of psychological symptoms, the timing of any stigma reduction strategy may be as important as the content. Any public health-level intervention might best be delivered when personnel have completed the post-deployment transition in a static location where any post-deployment psychological symptoms are emerging rather than in the deployed location or immediately post-deployment. A specific message could be formulated for personnel with increasing mental health symptoms, perceived subjective psychosocial problems and for those who are interested in receiving help. Information campaigns could suggest that emerging or unremitting psychological symptoms are indicators that mental health support is required, that some personnel may know that they have a problem but may not be seeking help on the grounds of misperceptions about the potential consequences of help-seeking. Given the consistent background levels of stigma/BTC identified in the various studies, it may be that, although laudable, eradicating stigma/BTC may not currently be a realistic goal. As a first step, any anti-stigma intervention might simply seek to return elevated stigma/BTC levels among those with new symptoms to those found among mentally healthy personnel. The timing of anti-stigma campaigns should be assessed in future comparative trials, preferably using RCT methodology. The latter should have clear objectives stating the desired level to which stigma should be reduced.

Help-Seeking and Secondary Detection

That the majority of symptomatic personnel did not seek help in the various studies concords with findings from US civilian studies where the majority of mental disorder cases do not

receive treatment (Wang et al., 2005). More recent studies suggest that among US military personnel, mental health help-seeking rates are improving, but remain obstinately low (Quartana et al., 2014). The help-seeking rates detailed in this thesis are generally lower than rates reported in recent UK civilian studies (Brown et al., 2014), but are in keeping with UK military studies (Hines et al., 2014). The rate of help-seeking for alcohol misuse was substantially lower than for mental health problems. Secondary prevention relies on the ability to detect symptomatic personnel so that progression to mental disorder can be reversed or managed. Psychological screening appears to be ineffective in predicting psychological breakdown, however, case finding through surveillance may be more helpful (Jones et al., 2003). Quite how such an approach would work in practice is not well articulated; therefore novel ways of facilitating help-seeking are required. As psychological symptoms are by and large hidden, encouraging self-referral or delivering training in the detection of symptoms in others may constitute potential ways of achieving this.

Operational Hardiness and Stigma/BTC

Osorio et al. (2012) assessed a composite dataset, of which the post-deployment stigma/BTC study was a component, to demonstrate that deployment stigma/BTC levels were high while significant reductions in stigma/BTC occurred immediately post-deployment. The authors suggested that deployment stigma might help to maintain 'presenteeism' where symptomatic personnel attempt to 'keep going' to complete their period of operational deployment. The post-deployment study follow-up results suggested that stigma levels began to rise significantly during the months following deployment. This may have been related in part to increases in overall levels of probable mental illness symptoms rather than being a general post-deployment effect. The OMHNE deployment survey results appear to reinforce Osorio et al's view that operational hardiness could be related to raised levels of stigma/BTC.

Further potential evidence for such a notion can be seen in the post-deployment study results where around two thirds of personnel who experienced subjective psychosocial problems while deployed completed their operational tour without seeking help. Those experiencing such problems whilst deployed were significantly more likely to hold stigmatising beliefs than those who did not experience them. Perhaps a case could be made for leaving deployment stigma/BTC untouched. A strong cautionary note is required however. Firstly, there are multiple health equality reasons for attempting to reduce stigma/BTC and promote help-seeking (Hatzenbuehler et al., 2013). The consequences of bolstering operational hardiness through not addressing or encouraging stigmatisation remain largely unknown. There may be scope to evaluate whether such an approach indeed exists and if it does, what are the longer-term psychological consequences for deployed symptomatic personnel who attempt to conduct themselves in a way commensurate with a hardiness agenda?

Alcohol Use and Help-Seeking

Consistent with other published military research, alcohol use was substantial among non-deployed help-seeking study participants with a full third screening positive for possible harmful alcohol use using a high screening cut off score. In keeping with previous military studies, alcohol misuse appeared widespread and help-seeking for such problems was infrequent; around 30.0% of alcohol misusers had sought help, mainly from informal sources. This figure is commensurate with the rate of help-seeking for alcohol problems reported by Iversen et al., (2010) which was based upon data obtained during 2006-2007. Similar low rates of help-seeking among substance using young people have been reported in international studies (Oleski et al., 2010; Reavley et al., 2010).

It seems that alcohol misuse is a stubborn and widespread problem that has not improved over a protracted period amongst UK AF personnel. Previous UK studies have reported rates of hazardous alcohol use of around 67% using a cut off score of ≥8 on the 10 item AUDIT (Fear et al., 2007) and rates of 13% for alcohol use that might cause physical harm using a higher cut off score ≥16. The substantial level of AUD classified using a substantial cut off score on the AUDIT-C in the non-deployed help-seeking study suggested that it was perhaps more problematic in a static Army garrison setting than has been demonstrated in prior studies of UK AF personnel. This may be a reflection of the greater than expected number of young soldiers in the study, who are thought to be at greater risk of alcohol misuse (Jones and Fear, 2011) or to the use of a brief screening measure that can inflate the number of potential cases, mainly through the failure to differentiate between raised episodic consumption and sustained heavy drinking, whereby the two groups are conflated into one (Nordqvist et al., 2004).

In the non-deployed help-seeking study, Stigma/BTC levels were lower in alcohol misusers than in those reporting mental health problems and the study results suggested that personnel, as the literature suggests, may not seek help as they viewed their use as potentially embarrassing, but not of great concern (Cunningham and Breslin, 2004). There are some clues as to why this might be the case. Although largely unaffected by stigma/BTC, alcohol misusers reported significantly higher levels of potential embarrassment arising from help-seeking than non-misusers and they were also more likely to feel that psychological problems would work themselves out spontaneously. Military personnel appear to be remarkably resilient to the effects of alcohol. Research findings suggest that functional impairment appears to be concentrated in those reporting only the highest levels of alcohol use (Rona et al., 2010). Given that misuse levels reported in the non-deployed help seeking study were

lower than the levels assessed by Rona et al., although this was not assessed, few may have experienced any short-term negative impact and may therefore not have been motivated to reduce their alcohol consumption. Further evidence for the tolerance of behavioural problems among alcohol users might be related to the finding that alcohol misusers were significantly more willing to work with and continue a relationship with a friend or colleague with a mental health condition.

The post-deployment stigma/BTC study results reinforce the notion that alcohol misusers may simply fail to recognise that they have a problem. It is notable that previous research has found that alcohol dependency is a severely publicly stigmatised condition (Schomerus et al., 2011) which might promote secrecy and non-disclosure. Unlike the non-deployed help-seeking study results, there was some evidence that post-deployment alcohol use was stigmatised where stigma/BTC levels among personnel drinking alcohol in a potentially harmful fashion after returning from deployment were double those found among non-misusers. Self-recognition and disclosure of problematic alcohol use may well be the key to facilitating help-seeking. This is potentially important as, in the post-deployment stigma/BTC study, alcohol misuse in the absence of recognition did not appear to drive help-seeking. Around one fifth of personnel had consumed potentially harmful levels of alcohol some four to six months post-deployment. Although greater levels of use were not associated with higher levels of help-seeking, seeing oneself as having a problem seemed to have some effect. Compared to AMD cases, the starkest difference in help-seeking rates between problem recognition and measured usage was for harmful alcohol use. Overall, those personnel who felt that they had an alcohol problem were the most likely to seek help whereas those who were classified as having AUD were the least likely to seek help.

Which forms of support might be most appropriate and helpful to military alcohol misusers is currently unclear. Alcohol misuse in the UK general population is a stubborn and enduring problem and with the exception of supply-reduction and cost escalation, few truly effective interventions are available. Recent studies of empirically promising interventions such as alcohol use disorder screening and brief intervention in primary care have yielded somewhat equivocal results (Saitz, 2014; Heather, 2014). In the post-deployment stigma/BTC study, there was some evidence that alcohol use was stigmatising as stigma/BTC levels among those with AUD were double those found among non-misusers. Anti-stigma campaigns and alcohol use reduction strategies should therefore ideally contain a component that aims to encourage those who misuse alcohol to recognise that perceived barriers to care may be preventing them from seeking support and to encourage them to view their alcohol use as problematic and worthy of being managed. If such a strategy is used, further studies are required to establish the optimum content of education-based alcohol interventions for UK military alcohol misusers. Current trends suggest that education is likely to be used in the future as it is popular among military commanders despite evidence that it is largely ineffective. Such strategies should ideally address the inhibiting effects of stigma/BTC upon alcohol related help-seeking and although stigma-reduction may not be ideal as there is an argument to say that alcohol misuse should be stigmatised, personnel should be encouraged to recognise when their negative views of helping services are preventing them from coming forward for support for alcohol misuse.

Tertiary Prevention

As described in the introductory chapter, tertiary prevention is mostly concerned with providing timely and effective treatment for those suffering with established mental health

disorders to return them to full fitness or to improve their quality of life. The tertiary prevention studies were carried out both during deployment and in the home base and were concerned with evaluating whether clinical intervention for those seeking mental healthcare was effective in returning military personnel to their place of work and maintaining them within the operational area or in their non-deployed military role respectively. In addition, the longer-term occupational impact of using the principles of forward psychiatry during deployment and an early return to work policy in the home base were assessed.

Deployment Mental Health – Evacuation

During combat deployment, the main aim of mental health support is to contribute to the effort to maximise the numbers of mentally fit personnel available for operational duties. This is achieved by providing robust therapy or management for those affected by psychological symptoms. Management options can include removal from deployment for refractory cases so that care can continue in the home base. Studies of non-UK national military forces suggest that the rate of any-cause medical evacuation from deployment can be substantial (Cohen et al., 2010) and a US study suggested that the rate of evacuation on the grounds of mental ill-health was large (Stetz et al., 2005). Some studies suggest that evacuation might be associated with poorer long-term mental health (Harman et al., 2005) irrespective of whether it is undertaken for physical illness, injury (Forbes et al., 2012) or for mental health reasons (Turner et al., 2005). Although evacuation can have longer-term psychological effects, it has been shown to bring about immediate and rapid improvement in presenting symptoms for substantial numbers of evacuated personnel (Rundell, 2006). Although longer-term mental health was not measured directly, no significant association

between evacuation, reduced occupational fitness and adverse occupational outcome was found in the deployment healthcare study.

As noted earlier in this thesis, there is a paucity of international research into the longer-term effects of receiving mental healthcare during deployment and major international differences in how such care is delivered. An earlier study conducted among UK personnel serving in Iraq suggested that evacuation home following mental health assessment or a trial of treatment was associated with a negative occupational impact in the longer term, however, no such association was found in the current deployment study. In fact, FMHT care appeared to be effective in helping to maintain the fighting power of the deployed force by retaining three quarters of those referred to the FMHT within their operational unit. The overall return to duty (RTD) rate was similar to the rate of 71.6% reported in the Jones et al 2010 study of mental health casualties in Iraq. It is perhaps not surprising that in the deployment healthcare study, around 17.0% of personnel with no assigned psychiatric diagnosis were evacuated and in the operational context, may reflect poor tolerance of problematic behaviour by non-psychiatric trained personnel. Unit commanders and their staffs may therefore opt for the easier decision of returning a person to the UK rather than back to duty. In this case, mental health assessment may have acted as a safeguard to establish whether there was a condition that could have been managed without recourse to evacuation. For those with no assigned diagnosis, evacuation was often classified as being on welfare rather than psychiatric grounds.

Adverse Discharge from Service and Other Negative Outcomes

Although the rate of longer-term negative occupational outcome in the current study (33.5%) appeared marginally higher than the figure found amongst Iraq personnel overall (26.5%), the

latter was made up of various forms of discharge and did not include reduced occupational fitness or indiscipline. It is striking that the rate of longer-term unplanned discharge in the deployed healthcare study was much lower than that found in the Jones et al 2010 Iraq study. In the latter there were 212 adverse discharges among 801 personnel in the two years following first contact with the FMHT, whereas 63 negative occupational outcomes were recorded in the same period among 445 personnel who provided longer-term outcome data in the current study. In addition to the use of a more inclusive definition of negative longer-term outcome in the current study, reserve forces were excluded and a three Service sample was used. Furthermore, greater numbers of young, junior ranks featured in the current deployment healthcare study sample. Substantial numbers of such personnel will be serving on short duration contracts and so will be more likely to complete their elective service term unhindered by reduced occupational fitness, whereas those on medium and long-term contracts will be more likely to encounter negative health effects and will have a far longer period within which to accrue negative occupational outcomes. Conversely, the Iraq sample was composed of Army personnel only and included reserve forces who can leave the military almost on demand. These differences notwithstanding, the outcomes suggest that the rate of adverse discharge has reduced markedly in recent years. It was unclear whether this arose from better organised post-evacuation healthcare provision, better selection of personnel for deployment, or if other factors contributed to higher levels of retention in service.

Although the current data suggests that a negative longer-term occupational outcome will occur for around a third of personnel referred to the FMHT, it does not give any indication about the specific long-term mental health effects of receiving deployed mental health care; occupational outcome merely functioned as a hypothesised proxy for mental health status.

Despite this shortcoming, the study results nevertheless suggest that military leaders should ascertain how best to offer support to deployment mental health casualties both during deployment and in the longer-term. Recent studies suggest that experiencing greater levels of post-deployment mental health symptoms is associated with an increase in post-deployment violent offending (MacManus et al., 2013). There is a tentative suggestion in the current data that in-service offending rates reported in the current study were remarkably low. This could have resulted from poor recording of disciplinary offences and unfortunately it was not possible to establish what might have happened to personnel after they left service.

Occupational Effects of Psychotherapy during Deployment

The deployed healthcare study results suggested that diagnoses other than PTSD were the main focus of FMHT activity and given that pre-deployment training for deploying mental health personnel often focuses on short duration PTSD therapies, forward psychiatry principles should be developed for general mental health conditions particularly as non-combat stressors appeared to have a substantial effect upon deployment mental health. The study did not assess therapy and management in depth and future studies should assess the differential effects of varying forms of therapy and the effectiveness of treatments for different forms of mental disorder occurring in the context of deployment. This may be critical as in the non-deployed mental healthcare study, those in receipt of medication and who had a more complex clinical presentation had the highest rate of reduced occupational fitness compared to those receiving other forms of therapy. Although it is unlikely that treatment with psychoactive medication would be initiated for UK military personnel in the deployed setting, it would be helpful to have clear guidelines concerning the threshold for and determinants of evacuation for treatment at home.

The Management of Non-Mental Health Cases During Deployment

The reasons for FMHT referral for personnel with no assigned psychiatric diagnosis was unclear. Future studies should seek to explore in detail the events that precipitate referral for mental health assessment in the absence of psychiatric symptoms. Developmental work and subsequent evaluation is required to determine the optimum strategy for managing personnel who are deemed not to have a mental health condition as they were as likely as those with mental health problems to experience negative long-term occupational outcomes. It is probably unhelpful to use the medical evacuation route to remove personnel in this category from deployment and alternative, creative welfare, personnel or discipline-based approaches may be more helpful and appropriate both for the referred person and those who command them. The determinants of long-term occupational outcome were far from clear for all those referred as the study did not assess how personnel were managed following their return from deployment. Future studies should therefore attempt to evaluate the different forms of support delivered to personnel without mental health symptoms both during deployment and in the longer-term. The latter probably applies to mental health casualties in equal measure.

Tertiary Prevention and the Management of Vulnerability

In the deployment healthcare study, greater psychological vulnerability was linked to increased evacuation risk, susceptibility to longer-term negative occupational outcome and has been shown to be important in other UK military research (Mulligan et al., 2012). Deliberate self-harm was a significant predictor of evacuation from deployment, although in the current study, DSH itself was not associated with negative longer-term occupational

consequences. This may support the notion that post evacuation management and healthcare arrangements have improved for UK AF personnel since the earlier study was undertaken in Iraq, perhaps allowing for greater levels of retention in service following deployment mental healthcare. It may be that the substantial threat environment of Afghanistan has engendered a more sympathetic understanding of self-injurious threats and behaviour than was the case for personnel who undertook earlier deployments to Iraq. Unfortunately, data were not sufficiently detailed to assess whether different forms of self-harm were less or more impactful, how they were related to current symptoms and whether they impacted upon the management strategy chosen by the FMHT. Future studies may benefit from the inclusion of a detailed description of the content of suicidal ideation or the nature of DSH acts in the research database.

Referral Sources and Occupational Outcome

It was hypothesised that personnel who consulted informally with the FMHT would be significantly more likely to be classified as having no psychiatric disorder compared to those who came through formal routes such as the unit medical officer and chain of command. This did not occur and informal were as likely as formal referrals to receive a mental health diagnosis. Furthermore, there was no evidence that they fared any worse or better occupationally than mental health casualties. To ensure that this was not a chance finding, future occupational mental health studies of this kind may need to compare the occupational outcomes for units operating a self-referral policy with those arising from deployed units utilising the formal referral route.

Received UK military medical doctrine suggests that all referrals for mental health assessment should be routed through the unit medical officer. During the period of the deployment healthcare study conducted in Afghanistan, this doctrine was adapted to provide a more flexible approach. It is wholly possible that the self and chaplain referral route are a useful way of overcoming potential barriers to care which have been shown to impede access among substantial numbers of personnel who might otherwise benefit from support (Osorio et al., 2012) allowing personnel with early, more easily managed, mental health complaints to be dealt with effectively while offering a viable alternative to formal medical officer or chain of command referral.

The Effects of Non-Combat Stressors and Deployment Healthcare

When deployed personnel referred to the FMHT experienced non-combat operational stressors, or found that adjustment to the operational environment was problematic, then evacuation was more likely following receipt of care. Currently, the FMHT receives pre-deployment training which, in the context of combat operations, aims to prepare staff to deal with combat stress reaction. Given that non-combat stressors had a significant occupational effect, further research is required to investigate methods preparing or indeed, within an occupational medicine framework, selecting personnel for deployment. If the effects of non-combat stressors could be minimised, this could bring about better prospects of completing deployment without recourse to mental health support. Personnel who appear to struggle with deployment life or who react unfavourably to non-combat stressors may require more intensive management by their seniors and officers which might negate the requirement for mental health assessment. This is perhaps a finding worthy of consideration since non-combat stressors are equally as likely to impact on the large numbers of military personnel who deploy on combat support missions to relatively safe austere environments, humanitarian missions, extended military exercises or routine deployments such as those undertaken by warships or submarines.

The argument about the main focus of FMHT clinical activity could perhaps be extended. Although PTSD is undoubtedly a central outcome related to combat deployment and a focus of contemporary military research, the outcomes of the deployment healthcare study suggested that negative longer-term occupational consequences were unrelated to mental health diagnosis at the time of FMHT referral, although anxiety and depressive disorders approached a significant association with longer-term outcome. This suggests that rather

than perhaps viewing combat exposure and associated conditions as the main effort of the FMHT, forward psychiatry for general mental health conditions should be further refined especially in view of the impact of non-combat operational stressors reported above.

Tertiary Prevention - Non-Deployed Mental Healthcare

Short-Term Occupational Fitness

The non-deployed healthcare study results suggested that socio-demographic characteristics were not significantly associated with short-term occupational outcome, which is somewhat surprising. Previous research suggests that male gender, having a combat role and youth are known risk factors for poorer mental health in a military context (Iversen et al., 2008; Iversen et al., 2009); this finding has been replicated in international studies (Riddle et al., 2007). Studies of help-seeking in UK AF personnel suggest that women are more likely to seek help for mental health problems while commissioned officers are less likely to do so (Hines et al., 2014). Furthermore, younger military personnel are known to have poorer adherence to treatment (Seal et al., 2010). That greater difference in short-term occupational outcomes was not demonstrated for patients with a combat role (Fear et al., 2010), between the three Services (Sundin et al., 2010) and among the sexes (Woodhead et al., 2012) was therefore unexpected. Two socio-demographic factors, Service background and sex, were associated with longer-term outcome; these are explored below.

Socio-Demographic Factors, Long-Term Occupational Fitness and Adverse Discharge

The study results suggested that Army personnel experienced poorer long-term occupational fitness compared to RAF personnel; there were insufficient numbers of RN personnel with long-term outcome data to perform robust analyses. This may not be altogether surprising as previous research has shown that Army personnel often have poorer mental health than other branches of the UK AF overall. This may possibly be related to the greater proportion of combat personnel in the Army who undertake arduous military roles (Forbes et al., 2011). Additionally, there is a lower academic requirement to undertake non-technical tasks in the Army while technical trades predominate in the RAF. As a consequence, the Army tends to recruit from areas of social deprivation which may inadvertently increase the level of risk related to childhood adversity (Buckman et al., 2013). The study outcomes suggest that further work is required to establish how best to promote better longer-term mental health among Army personnel referred for mental health treatment. Women were more likely to have poorer long-term occupational outcomes although this finding became borderline non-significant when adjusted for clinical and therapeutic factors and may have been related to the greater levels of clinical factors associated with poorer occupational outcomes found among the women in this sample.

Comparisons with Whole Force Occupational Fitness

Across the UK AF, the overall annual rate of reduced occupational fitness arising from mental as well as physical ill-health, including recommendation for medical discharge was 18.6% in 2013. The rate was lower among RM/RN personnel (14.5%), among RAF personnel it was 14.3% and in the Army it was 21.5% (RAF Health Report 2012/13). Other research conducted among UK military personnel has reported a far lower recorded medical

downgrading rate of 4.4% (Hayton, 2004) although this was found amongst an elite commando unit where levels of mental and physical fitness are known to be high (Sundin et al., 2010). In the current study, among personnel referred for mental health assessment, the annual rate of reduced occupational fitness arising from both mental and physical conditions was approximately double the annual rate for the UK AF throughout the period of follow-up. It may be that referral for mental health assessment represents a substantial risk factor for long-term reduced occupational fitness as the overall rate of reduced occupational fitness compared unfavourably with available whole force data. Whether other forms of secondary healthcare are associated with similar rates of reduced occupational fitness is unclear.

In a self-report study which surveyed personnel with and without current medical symptoms, the any-cause medical downgrading rate was 12.4% among 2873 UK AF personnel (Rona et al., 2006). Although the current study data were objective rather than self-report, the levels of medical downgrading were double the self-report study figure during the earlier periods of follow-up and almost treble the rate in the later period of follow-up post discharge from care.

For medical discharge, an official health report describes an annual rate of 0.5% for the RAF, 1.2% for the RM/RN and 1.6% for the Army. Reviews of RAF medical and personnel records have generated annual rates of medical discharge of 0.2% for 1988, 0.3% for 1999, 0.4% for 2000 and 0.5% for 2004. Medical discharge has also been studied among members of the Parachute Regiment, an elite airborne infantry formation where a rate of 4.9% was found (Bricknell, 1999) and was largely attributable to parachute role-related physical injury. According to official Ministry of Defence figures, the crude rate of medical discharge between 2008/9 and 2012/13 was 0.9% for the RN/RM, 0.9% for the Army and 0.4% for the RAF. Discharge for mental health reasons constituted 11% of all discharges for the RM/RN, 14% for the Army and 18% of RAF medical discharges (Defence Statistics, 2012). The

available data therefore suggests that medical discharge occurs at an annual rate of between 0.2 to 1.6%. Among the participants in current study, the annual medical discharge rate varied between 10.0% and 20.5% in the four early periods of evaluation (6 months to 2 years eleven months), and between 4.9 and 7.0% during the last two periods (three years to four years or more). It appears that in addition to medical downgrading, compared to whole force data, mental health patients as a discrete sub-group appear to be at substantially increased risk of medical discharge from the Services.

Predictors of Occupational Fitness – Clinical and Therapeutic Factors

Short-Term Outcomes

A range of clinical and intervention factors were significantly associated with reduced short-term occupational fitness including the type of intervention received (medication, psychological intervention and assessment with additional advice), diagnosis and management by the multi-disciplinary team. In keeping with previous research findings, a number of psychological and behavioural factors predicted reduced short-term occupational fitness on completion of care, including historical DSH (Green et al., 2011) and previous referral to psychiatric services. Given that there was some evidence of interaction between MDT management and a number of clinical and therapeutic factors, it appeared that the overall complexity of clinical presentation may have been the single most important determinant of short-term occupational outcome.

Levels of Intervention

In the non-deployed setting, one third of referred personnel were assessed, given advice and not taken onto a clinician's caseload; around 88.6% of those who were not assigned a diagnosis received this form of intervention compared to 19.0%-35.7% of those with a formal diagnosis. This approach appeared to be effective in the short-term with around 80.0% of personnel returning to work in an occupationally fit capacity. In the longer-term around a third of personnel who were merely advised and discharged became occupationally unfit with longer-term occupational outcome rates not dissimilar to those who received a psychological intervention. The rate of reduced occupational fitness was similar across diagnostic categories including among those with no assigned diagnosis. When the various therapeutic interventions were graded by intensity, 83.0% of personnel received some form of brief intervention, which in most cases (80.0%) was provided by a single mental health professional without recourse to MDT involvement. Although brief interventions appear to return substantial numbers of personnel to work in an occupationally fit capacity, mental health staffs may need to generate creative ways of maintaining therapeutic gains post-discharge irrespective of the intensity and form of the initial intervention. Rather than diagnosis per se, a range of clinical and intervention factors were significantly associated occupational fitness most of which appeared to be markers of the complexity of clinical presentation. This aspect of the current study certainly deserves to be examined in future studies as it would be helpful to military clinicians to have some sense of the likelihood of both returning to duty and completing an elective term of service following different forms of therapy. At present, such markers are not well articulated.

Past Psychiatric Referral

In the non-deployed healthcare study, it was notable that 55.5% (n=1551) of referrals had previously sought help for a mental health problem; it was not clear whether this related to the pre-enlistment period or an episode of in-Service care. Although it is but one factor among many in a complex causative process (Davydov et al., 2010), psychological vulnerability is known to be a risk factor for poorer mental health (Ryff and Singer, 1996). Although past referral was not significantly associated with longer-term reduced occupational fitness, it predicted a poorer occupational outcome in the short-term. Research is required to assess whether substantial numbers of personnel are entering service with a history of mental health treatment and whether this finding is relevant to other DsCMH. If psychiatric contact is taking place during service, medical planners may wish to consider how they might establish measures to minimise the occupational impact of recurrent referral to psychiatric services.

Mental Health Cases with Mild or No Symptoms

The results of the non-deployed healthcare study suggested that 14.2% of those referred to the DCMH did not have a mental health condition and a 5.1% had mild adjustment disorder; it is notable that 92.4% of these cases experienced full short-term occupational fitness on completion of care. However, 37.2% experienced reduced longer-term occupational fitness or adverse discharge. The data therefore suggest that around a third of the least unwell referrals to the DCMH experience a poor longer term occupational outcome. It may be that people who are not assigned a diagnosis following assessment are dissatisfied with military service rather than ill and it is likely that longer-term reduced occupational fitness may be less related to their mental health and possibly more to a desire to leave the military by any

means. The latter notwithstanding, it would appear that relapse prevention post-discharge from care is an important consideration irrespective of the assessed condition.

The Management of Adjustment Disorder

In the non-deployed healthcare study, 42.2% of personnel were assessed as having adjustment disorder, the milder form of which, as described above, was associated with both short and longer-term occupational fitness rates not dissimilar to those found among personnel without mental disorder. The rate of short-term reduced occupational fitness doubled in cases of severe adjustment disorder compared to the milder form, although the rate of longer-term reduced occupational fitness was similar. Adjustment disorder does not appear to be a unitary category of disorder. The study outcomes suggested that adjustment disorder could be graded according to severity as the categories appear to have quite distinct occupational outcomes. At present, no structured interventions or clinical guidelines for adjustment disorder exist and could be developed for use in military mental healthcare and probably more widely in a civilian context. Given that adjustment disorders formed the bulk of DCMH referrals, there may be considerable scope for improving outcomes by managing severe cases more intensively. For instance, when used as a component of work-based wellness schemes, behavioural activation techniques have been shown to shorten the length of sickness absence when delivered as an early intervention (van der Klink et al., 2003) and may be worth considering when managing adjustment disorder in a military context. The military behavioural activation and rehabilitation course (MBARC) has shown promise in treating military patients presenting with common mental disorder (Wesson et al, 2014) and may be of use in cases of severe adjustment disorder.

Common Mental Disorder Management

Cases of psychotic illness and personality disorder were infrequently seen but had the highest rates of reduced short-term occupational fitness. Anxiety or mood disorders were the second most frequently assessed mental health problems and excluding psychotic illness, had the greatest adjusted odds of developing both short and longer-term reduced occupational fitness and adverse discharge. Occupational interventions targeting workplace disability associated with common mental disorders, which constitute the bulk of DCMH patients, are not well researched (Henderson et al., 2011); however, there is some evidence that implementing a preventative intervention using cognitive behavioural and problem solving techniques can be effective among employees who are at high risk of sickness absence secondary to depression (Lexis et al., 2011). This approach might be helpful as a relapse prevention strategy for those who have completed DCMH care for mood disorders, though such an intervention would require validation among military personnel. In the current study, the optimal form of intervention for promoting longer-term occupational fitness was unclear. Following adjustment for confounders, varying intensity of intervention appeared to have no significant impact upon longer-term occupational fitness although there was a borderline effect for medication being associated with poorer longer-term occupational outcome. In the short-term, medication was associated with significantly poorer occupational outcome while psychological intervention appeared to be associated with better outcomes. The results of examining interactions in the data appeared to suggest that multi-disciplinary team management, a number of clinical risk factors and intervention interacted. It therefore seems that further research is required to establish which therapeutic approach is optimal for military personnel with more complex clinical presentations.

Alcohol

In the non-deployed healthcare study, 22.9% of men and 21.5% of women consumed potentially hazardous or harmful amounts of alcohol; 14.7% had mental disorders co-morbid with alcohol though neither consumption level nor co-morbidity predicted short or longer-term occupational fitness. Hazardous and potentially harmful alcohol use are both common among UK Service personnel (Jones and Fear. 2011). There is an ongoing debate about the role of alcohol in military culture as it has been shown to be associated with positive outcomes such as improved cohesion (Browne et al., 2008) and research within UK AF suggests that only at high levels of use do functional impairment, co-morbidity and increased mortality occur (Rona et al., 2010). There is as yet no detailed published outcome data evaluating the long-term physical effects of heavy alcohol use during military service among UK veterans which, given the levels of in-service use, could be substantial. Although various metrics have been used to classify hazardous alcohol use rates in studies of UK AF personnel, the data suggest that despite an estimated UK AF wide alcohol misuse rate of 67%, few personnel seek help from clinical services (Fear et al., 2007). These outcomes confirm the suggestions in the various referenced studies that only a proportion of those misusing alcohol seek help and the findings of the current study suggest that this happens most frequently when alcohol misuse is co-morbid with a mental health condition rather than the primary diagnosis; 70.5% (n=158) of alcohol misuse cases in the non-deployed healthcare study were co-morbid.

The Financial, Organisational and Personal Impact of Longer-term Reduced Occupational Fitness

As well as representing a loss of investment for the UK AF, the elevated rates of medical

discharge among the military personnel in this study may have a substantial future financial and health impact for those affected, which can arise from the influence of stigma-related discrimination in the workplace (Sharac et al., 2010) or the direct occupational effects of mental illness (Butterworth et al., 2012). Examining and mitigating the determinants of discharge from the military on health grounds is essential as a relatively small group of Service personnel, including those with symptoms of mental disorder, struggle to transition successfully out of the military (Ashcroft, 2014). Adverse mental health outcomes following discharge from service are a cause for concern as discharge on completion of a military career represents a form of early retirement among a group who involuntarily leave their chosen jobs far earlier than their civilian counterparts and who will often be required to seek a second career. Among civilian cohorts, early retirement for mental health reasons has been shown to occur at a younger age than for physical disorders, resulting in the greatest loss of working years among the various disorders that were evaluated (Knudsen et al., 2012). An Australian study reported that early health-related retirement, including retirement on mental health grounds, resulted in substantially lower annual income than that received by full-time employed counterparts even when financial assistance was accounted for (Schofield et al., 2011). Some studies report a substantial adverse mental health impact resulting from early retirement, particularly among men (Buxton et al., 2005), while early retirement taken on health grounds may be associated with particularly poor mental health in the post-retirement period (Jokela et al., 2010).

The rate of short-term reduced occupational fitness exceeded the rates of this outcome in the UK AF as a whole for any year for which outcome data was available. This is not altogether surprising as risk factors such as deliberate self-harm, rules about holding a reduced medical category while taking psychoactive medication and so forth, will mean that the treating

clinician may have little choice but to invoke medical downgrading to ensure that a period of protection from deployment is in place for the treated individual. What is more striking is that the rate of both reduced occupational fitness and medical discharge among military mental health patients is far greater than among the whole UK AF at all time-points post completion of the care episode. The comparisons made between the study sample outcomes and the overall rates of occupational fitness in the whole force appear valid since the outcomes reported include both mental health and physical health within the occupational fitness categories.

Deliberate Self-Harm

Although DSH was not included in the literature review, it emerged as factor in the clinical studies. Research suggests that the rate of suicide among UK AF personnel is lower than the general population (Fear et al., 2009), assessment following an act of deliberate self-harm was not insubstantial among those referred to the DCMH for assessment, being a factor in around 6.1% (n=181) of referrals; the association between reduced short-term occupational fitness and DSH was borderline when other factors were controlled for. It is perhaps not unsurprising that for cases involving DSH, reduced occupational fitness on completion of therapeutic contact occurred in around a third of cases. All Service personnel have access to weapons, albeit in a controlled manner and the concerns about access to lethal force may be reflected in the reduced levels of occupational fitness on completion of care. Referral following DSH did not function as a risk factor for longer-term reduced occupational fitness; those carrying out acts of DSH were statistically no more likely to be medically downgraded or administratively or medically discharged in the longer-term. This finding seems logical as DSH risk management requires a period to elapse following completion of care for sufficient

confidence to be built prior to allowing full access to weaponry and the restoration of full occupational fitness. It does not necessarily follow that DSH should persist in the longer term and this is reflected in the study outcomes.

Relapse Prevention and Re-Referral

The outcomes of the non-deployed healthcare study suggested that, although brief interventions employed by DCMH staffs are effective in returning people to work, some form of relapse prevention needs to be put in place post discharge. At present, around one third of personnel appear to be at risk of reduced occupational functioning post-discharge from care. Quite what form this kind of intervention should take is not clear as it was not investigated in the current study. Future development work in this area should seek to evaluate the impact of introducing such strategies to ensure that those who have received military mental healthcare have the best chance of sustained recovery and meaningful military employment. There is some evidence that non-medical measures such as good social support and appreciation of individual effort at work by leaders can help to maintain people with mental health symptoms in work (van den Berg et al., 2010) although general preventative interventions delivered to low risk individuals have been shown to be somewhat ineffective (Saltychev et al., 2012). The study further suggested that over half of those referred to the community team had previously sought help for a mental health problem, although it was not significantly associated with longer-term reduced occupational fitness, it predicted a poorer occupational outcome in the short-term. Given the potential personal and occupational burden of recurrent mental disorder, UK Defence Medical Services may wish to consider developing formal relapse prevention interventions to maintain psychological health following completion of a mental health care episode. Furthermore, recurrent mental health referral should be carefully

evaluated in future studies in as wide a number of military mental health treatment centres as possible to assess whether it is a reliable precursor of poorer military functioning. If this is found to be the case, recurrent referral could be used as an indicator that a more prolonged period of monitoring or planned early managed discharge from the UK AF may be required for those presenting with such a history. As a final note on medical discharge, it may be that, far from being a negative occupational outcome, planned, properly supported medical discharge from the UK AF may be the most appropriate and helpful outcome for the person affected by unremitting mental health symptoms and military command more generally.

Implications for Stigma Reduction Campaigns

The findings of the non-deployed healthcare study have the potential to further extend the current understanding of military stigma. The non-deployed help-seeking and post-deployment stigma/BTC study results suggest that seeking mental health treatment in a military context appears to be associated with a fear of negative career consequences. This is an important finding as stigma reduction programmes and positive mental health campaigns often attempt to combat fears of career impairment if mental health treatment is sought by down-playing potential adverse occupational consequences. The results of the current study seem to indicate that the risk of such an outcome in the context of mental health help-seeking is substantial and in the longer term may affect a quarter to a third of all those who are referred for mental health assessment in a non-deployed setting. Some modification to the central messages of military anti-stigma campaigns may be necessary as seeking mental health treatment appears to involve taking an occupational risk and contrary to positive mental health messages, does carry an increased possibility of a negative occupational outcome. Perhaps this could be communicated in a sensitive way and should be balanced against the possibility that untreated mental health conditions may carry an even greater

occupational and personal threat which can carry over to one's post-service life and affect one's family.

Tertiary Care - Concluding Remarks

Maintaining positive treatment outcomes is particularly important for longer-term occupational fitness as substantial numbers of personnel referred to both the DCMH and the FMHT went on to experience reduced military occupational functioning or adverse occupational outcomes. In both studies, longer-term risk factors were diffuse and targeted interventions might be more problematic to deliver than is the case for short-term outcomes although improving short-term outcomes may be help with occupational function in the longer-term. For instance, would it be cost-effective for the Defence Mental Health Services attempt to put in place increased post-discharge support for all Army personnel treated for mental health problems when only a small proportion may benefit? Similarly, a history of past psychiatric contact may be difficult to focus upon after discharge as it may only be visible to those directly involved in clinical care. Arrangements could be made to monitor vulnerable individuals through their unit medical officer who would have access to any clinical reports detailing such a history. More research is required to establish what aspects of past psychiatric contact predict occupational adjustment, particularly as this finding was borderline non-significant when fully adjusted and outcome may be related to inter-related factors rather than past psychiatric history per se. A shortcoming of both the deployed and non-deployed healthcare studies was that no direct psychometric measures of mental health were obtained in either, therefore future studies of this kind might benefit from the inclusion of such measures and should ideally be longitudinal in design. Given that around a third of mental health cases experienced reduced occupational fitness in the longer term, it is

suggested that a measure of occupational functioning be retained in future studies of military mental health treatment as operational effectiveness is a prime concern for most military commanders.

Strengths and Limitations

The R&R Study

Before embarking upon a detailed discussion of the R&R study findings, it is necessary to consider certain aspects of the research to understand both strengths and limitations. The study design was intended to assess personnel both pre and post R&R, however, because of considerable logistical problems that arose in the arrival and departure airport terminal, a different sample group was assessed before and after R&R with only a small matched group participating at both sampling points. This limited the assessment of whether R&R substantially modified mental health symptom levels. Additionally, because the period of survey was extended over a longer than planned time period as a consequence of logistical challenges, personnel were surveyed during two different operational phases. Operational factors may have influenced the experience of R&R, for instance, personnel in the post-R&R survey group had completed a longer period of deployment and had experienced significantly greater levels of combat and operational exposure; as a consequence, they may have been more fatigued than the pre-R&R survey group. The sampling strategy employed in this study was not random and sampling bias could not be offset by employing a random sampling procedure as taking R&R was mandated for all those completing deployments lasting for six months. The characteristics of the R&R study sample differed from the broader UK AF in a number of respects, which may have biased the results to a degree; in addition to deployment length, the two survey groups differed significantly in the Service background proportions. The overwhelming majority of participants were from the Army so inferences cannot be

drawn about other types of rest such as shore-based leave for Navy personnel and brief periods of rest taken just outside the deployment zone in a safe area, known as operational stand-down. The R&R survey element was generated specifically for this study and, despite making every effort to ensure that the questions had ecological validity, the questionnaire was only tested in a small pilot study though validated measures commonly employed in military mental health research were used wherever possible. The use of PCA allowed for a detailed examination of the association between the components of R&R and mental health outcomes. Asking military personnel to supply personal information, which was necessary to match those who responded at both sample points, is known to influence levels of reported mental health symptoms; the use of identifiable information may have given rise to response bias (Fear et al., 2012). In addition, the study data are largely cross sectional and it was not possible to adequately assess causality. As reported in previous point surveys of deployed personnel, satisfaction with R&R was high; however, this does not mean that this will positively influence mental health outcomes. Finally, the focus of this study is about the effect of R&R upon the deployed Service person not their family and friends and it is not possible to comment upon the effects of R&R among loved ones.

As was the case with the discussion of the R&R study findings, it is important to interpret the TLD study outcomes with a number of caveats in mind.

The TLD Study

The TLD study had a number of strengths, chief among which was the use of IPTWs calculated from propensity scores to attempt to induce 'pseudo-randomisation'. This allowed me to conclude that TLD may have had an effect independent of confounding variables; in

effect, tentative causal inferences could be made as a result of employing this methodology. By applying IPTWs, it was possible to reduce the likelihood that the outcomes were heavily influenced by selection bias. It was possible to account for the effects of a range of known confounding variables such as age and engagement type, so that any observed effects were more likely to have arisen from TLD. It is possible that the assumption of unobserved confounding is incorrect and that there is unaccounted for or hidden bias. Bias, which could be resolved by randomisation, might include that which arises from personnel avoiding undertaking TLD by choice or influence, or being channelled to undertake TLD by commanders. Given that all variables used to calculate the PS were measured after TLD had been completed, it may be that the subjective impression of some variables such as the quality of leadership were subject to recall bias. The time from the end of deployment to the follow-up point differed between the two groups (TLD attendees mean = nine months, standard deviation eight months and controls mean = 17 months standard deviation 11 months); this potential confounder was included in the calculation of the propensity scores. This study examined the UK AF version of TLD which differs in length and content from that delivered by coalition partners; some caution is therefore advised when generalising the results to other models of TLD. A small number of personnel also took part in the study of UK Battlemind described elsewhere in this thesis and there is a possibility that exposure to a different form of psychological briefing influenced the findings; the numbers were likely to have been small as the study group responsible for the cohort and the Battlemind research always seeks to de-conflict the various military studies that are undertaken. As Royal Navy and RAF personnel were excluded from the analyses, it is not possible to generalise the findings to these personnel. Finally, it is possible that the measures of post deployment adjustment were too crude, did not target important areas of homecoming and thus failed to measure positive adjustments other than those specifically asked about.

The Deployment Mental Health Support Study

There were a number of strengths and weaknesses associated with the OMHNE study. A major strength was that the survey sampled deployed personnel in their place of duty including forward locations, not just in the relatively safe large centres such as main bases. This study therefore probably reflects a robust view of deployment mental health for UK AF personnel. Most studies that purport to examine deployment mental health do so by asking for retrospective accounts of deployment experiences which introduces the possibility of memory distortion. Furthermore, the surveys that have been undertaken to date have rarely discriminated between personnel deployed in extreme or remote locations and those in safer areas. Overall, the demographic profile of the two samples differed significantly on a number of key factors and, although an attempt was made to control for confounders in the multivariable analyses, it is possible that unobserved confounders or those not selected for inclusion a priori may have influenced the results. As with any cross-sectional data, it is not possible to establish the direction of cause and it is acknowledged that the outcomes are associative rather than directional. Finally, the sampling strategy was not random, however, the cluster-based pre-selection of visit locations based upon the requirement to include sufficient numbers of forward areas and representative personnel may have helped to offset some of the bias inherent in non-randomised sampling. Although potentially at-risk groups were over-sampled, there were sufficient numbers of representative personnel in the general survey sample to satisfy correct sub-group proportionality and the power requirements of the study.

Secondary Prevention Studies

Although some aspects of secondary prevention were assessed in the OMHNE study, the limitations of which were discussed previously, the bulk of the research findings were generated by the non-deployed help-seeking and post-deployment stigma/BTC studies. The following discussion of secondary prevention should be considered with a number of caveats in mind. The strengths of non-deployed help-seeking study included the random selection of personnel and achieving a high response rate. The use of multiple assessment tools to assess the impact of mental health, stigma/BTC and associated factors may have helped to triangulate on potentially important areas rather than adopting a single, direct measure. Although the survey contained an explicit definition of help-seeking, it was not feasible to objectively verify actual sources of support through personnel or medical record searches, neither was it possible to confirm whether those accessing medical forms of support received a definitive evidence-based intervention. Similarly, the quality and content of support received from non-medical sources, including the unit chain of command, chaplain and so forth remains unknown. A major weakness of the study was the lack of follow-up data which restricted the analyses to a cross-sectional format. This limited the ability to infer direction of cause and the outcomes remain associative. Although high levels of potential mental health outcomes were found among study participants, two of the measures used, the PC-PTSD and AUDIT-C were psychological symptom screening instruments that may have produced inflated numbers of positive cases compared to the full instrument or a clinical interview.

Similarly, a number of caveats should also be borne in mind when considering the results of the post-deployment stigma/BTC study. The study had a number of strengths, chief among which was the use of longitudinal data. Although the study was a secondary analysis of

intervention trial data, both the form of intervention and variable response rate at follow-up did not appear to introduce substantial bias. Although non-responders at follow-up in the RCT were not included in the analyses, there were no differences in baseline levels of mental health caseness, subjective mental health, stigma/BTC and help-seeking while deployed between responders and non-responders. It was possible to infer direction of cause given that stigma/BTC fluctuated with mental health status in a consistent way between the two sample points. The main weakness associated with the data source was that it was originally used to evaluate the effects of a mental health intervention which, although it had an equivalent influence upon stigma/BTC in both groups, appeared to modify alcohol use and may have influenced the study findings indirectly. Furthermore, the study sample was not wholly representative of UK AF characteristics; caution should be exercised when extrapolating the findings to the whole force. The latter notwithstanding, amongst the various sub-categories that were assessed, levels of stigma/BTC were not substantially different. As with any study that utilises self-report data, the assessment of mental health may not be as robust as the results of a structured clinical interview.

Tertiary Prevention Studies

There were a number of limitations which must be borne in mind when considering the outcomes of the tertiary care studies. The deployment database was compiled by multiple mental health practitioners deployed to Afghanistan over a protracted period of time. Although the effects of subjectivity, varying levels of experience and training cannot be ruled out as potential sources of bias, diagnostic categories were derived from in-depth clinical interviews conducted mainly by experienced military clinicians specifically trained to deliver deployment mental healthcare. Junior or inexperienced practitioners are not deployed unless they are deemed to be operationally competent and even then, they are generally supervised

by a senior clinician. An alternative approach to clinical interview would have been to use questionnaire-based measures to determine psychological status, however, research suggests that results generated in this way cannot be directly compared to clinical interviews (Eaton et al., 2000). Measures of illness severity which may have affected the results were not available and it is possible that personnel with more severe symptoms may have been evacuated more readily. That said, there was no evidence that illness category was associated with longer-term outcome. Although robust data linkage methods were used, the personnel databases may have been subject to inaccuracies, particularly for disciplinary data as information was entered by multiple users with different levels of training and seniority; however, all the data sources used were subject to regular audit and were given quality ratings. The clinical data were entered as a medical record which should have been associated with high levels of diligence. Neither this study nor any other study has used randomised controlled trial methodology, mainly because of the impossibility of performing such a study in operational conditions. In these circumstances it is likely that the decision to return to the UK was not random and issues such as the perceived critical nature of the military role of the affected person, symptom severity and suicide risk may all have played a part in the decision to evacuate. It is likely that only non-randomised data will ever be available on this subject. A major limitation of the research is that it was not possible to establish whether mental healthcare was sought by personnel after they returned from deployment, which would of course have influenced occupational outcomes. Although longer-term mental health outcomes were not measured in this study, occupational fitness is often associated with prevailing mental health and is an important outcome in an organisation that invests a great deal of resource and money in training its personnel.

For the non-deployed healthcare study, similar comments to those related to deployment

healthcare concerning strengths and weaknesses are relevant. Clinical interviews took place and real world fitness markers were used. As the non-deployed healthcare study emphasised medical fitness as an outcome, the markers may have incorporated physical as well as psychological health conditions which may dilute the conclusions related to the mental health impact of receiving care. It was possible to make comparisons with whole force medical fitness rates which also encompassed both physical and mental health outcomes. A major shortcoming of the study was that it was impossible to establish data linkage for longer-term outcomes in 42.0% of cases. Response bias related to socio-demographic factors did not affect the evaluation of short-term occupational outcomes; this may have introduced bias at longer-term follow-up which was corrected for using the application of a response weight. The latter notwithstanding, the reasons for failure to link data included incorrect recording of Service number, missing personal data, changes in the military data systems used to record occupational outcomes over time resulting in missing data and failure to record occupational outcomes in the personnel records. The reasons for absent longer-term data appeared random rather than systematic. The medical occupational fitness data were verified as being reliable by a third party responsible for producing official UK defence statistics. The decreased levels of reduced occupational fitness relative to the rates in the whole force could have been partially explained by the study design. The study analyses were conducted within-subjects, so the likelihood of each person being assigned a reduced standard of occupational fitness could have increased with time since discharge from the DCMH, whereas comparisons were made with between-subjects data collected from the whole UK AF which were cross-sectional. Caution should be exercised when drawing conclusions from such comparisons. The study was undertaken in a DCMH which was led by the Royal Air Force which may have influenced occupational fitness rates as, during the period of study, there were subtle differences in the way that the three Services approached occupational mental health

management.

Conclusions

R&R Although subjectively useful and popular, R&R did not appear to have a significant global beneficial effect upon mental health. Engagement with the R&R process was the key associate of better mental health and lower alcohol use. Personnel about to take R&R and their families might benefit from formal advice about how to best to use R&R. Minimising travel disruption from the operational area seemed critical to a positive R&R experience.

TLD Third Location Decompression did not appear to promote post-deployment re-adjustment but appeared to promote better mental health for some personnel. Given that some personnel benefited from TLD while others did not suggests that a nuanced approach to TLD is required and combat unit personnel in particular might benefit from a package tailored to their individual deployment experiences.

Deployment Mental Health Support Operational deployment does not appear to be associated with poorer mental health for the majority of personnel. Forward deployment was associated with sub-threshold and probable PTSD symptoms which were significantly associated with functional impairment. Mental health stigmatisation and barriers to care are substantial during deployment and are associated with poorer mental health. Perceived good leadership and perceived satisfactory family support were both associated with better mental health. Medical consultations appear to represent important occasions for detecting mental ill-health in deployed personnel.

Non-deployed Secondary Prevention – Help-seeking Around 40.0% of mental health cases and approximately 70.0% of alcohol misusers had not sought help or support. Stigma/BTC levels characterised by perceived potential negative occupational and social consequences arising from help-seeking were highest amongst symptomatic personnel who were interested in receiving support and substantial among symptomatic help-seekers.

Post-Deployment Secondary Prevention - Stigma/BTC Higher levels of mental health symptoms and potentially harmful alcohol use were associated with elevated stigma/BTC. Moreover, mental health disorder caseness appeared both necessary and sufficient for elevated stigma/BTC when other factors were accounted for whereas psycho-social problem recognition was not. However, the latter appeared to have an augmenting effect upon mental health symptoms in relation to stigma/BTC. Being symptomatic and interested in receiving support appeared to be associated with raised stigma/BTC where the latter appeared to inhibit help seeking.

Deployed Mental Healthcare Around three quarters of deployed personnel who became mental health casualties in Afghanistan were returned to their deployed unit in a medically fit capacity. Most adverse outcomes were related to impaired military functioning rather than attrition from service. Evacuation to the home base was often unrelated to combat, such as home front stressors and failure to adjust to deployment. Psychological vulnerability appeared to be the only predictor of poorer long-term occupational outcome. Around a third of the mental health casualties went on to have some form of longer-term negative occupational outcome. Self-initiated and chaplain's referral appeared to allow personnel an effective route into care and formal versus informal referral had no discernible effect upon occupational outcome.

Tertiary Mental Healthcare Community-based military mental healthcare successfully returned around three quarters of referred personnel to full medical fitness for deployment. The rate of long-term reduced medical fitness was at least double that of the UK AF as a whole irrespective of diagnosis and the possibility of medical discharge was also substantially raised. Complex clinical factors were the main risk factor for reduced short-term occupational fitness; for longer-term occupational fitness, being in the Army, being female and one's case being managed by the multidisciplinary team were the main risk factors. Help-seeking for alcohol misuse was rare unless such behaviour was comorbid with a mental health condition.

Summary Recommendations

Primary Prevention

R&R

1. The provision of Rest and Recuperation (R&R) during deployment should be further assessed for its impact upon mental health using a robust, within-subjects, longitudinal study design. Alternatively, mental health outcomes could provide a secondary outcome while the impact of R&R on morale could be assessed as this may be an important indirect component of deployment mental health support. Alternative models for providing R&R, such as rest-in-place taken close to the operational area should be developed and assessed while leave at home may be best reserved for those completing lengthy tours. The effect of R&R among family members should also be assessed to ensure that a comprehensive view of the mental health effects of R&R is generated.

TLD

2. TLD appeared to benefit the physical and mental health of personnel who experienced low to moderate levels of combat exposure while personnel in the highest combat exposure category did not appear to profit from the experience, however, it failed in its primary objective of promoting better post-deployment psychological readjustment. Alternative empirically derived models of TLD should be formulated and tested using robust study designs. In particular, post-deployment psycho-education should be further developed and evaluated for effectiveness and the optimum timing of delivery established.

3. It is suggested that, when promoting TLD, commanders should be wary about making excessive claims that it promotes better re-adjustment as it did not appear to do so.

Pre-deployment Stress Briefing

4. Pre-deployment stress briefing appears to have a positive mental health effect when UK military personnel remember having received such an intervention. Developmental research is required to establish the effective components of pre-deployment psycho-education for military personnel and revised briefings should be subject to rigorous testing using RCT methodology.

Leadership

5. Perceptions of good leadership appear to be associated with better mental health among deployed personnel; however, the way in which the components of leadership interact with mental health and other factors is unclear. Future studies should seek to determine which primary and secondary prevention components of leadership have the greatest impact upon mental health.

6. Given that most current studies use brief measures of leadership, a robust and comprehensive measure of leadership should be either identified in the literature or a new measure be developed and tested in future studies.

7. Further studies should be undertaken to determine whether leadership has a substantial anti-stigma effect and whether it contributes to mental health by facilitating engagement with helping services.

8. Secondary prevention activity as a component of leadership may need to encourage appropriate help-seeking for mental health conditions by promoting the caring and supportive aspects of the chain of command. Corrective messages delivered to prospective help-seekers should ideally focus on potential loss of trust, loss of confidence, embarrassment and being blamed by leaders.

Family Support

9. Among deployed personnel, perceptions of good family support appear to be associated with better mental health. Future studies using objective measures of family support should evaluate how family support impacts upon the deployed person's mental health.

10. As around half of personnel surveyed during deployment reported that family support was lacking, future studies using qualitative methodology may help to deconstruct family support into its component parts and to understand the level of support required. There appears to be a requirement for the MoD to develop family support measures and to make these visible to deployed personnel.

Welfare Support

11. The deployment survey suggested that reduced access to welfare support was associated with greater levels of acute stress symptoms though the mechanism by which this occurred was not clear. Future studies should use mixed qualitative and quantitative methodologies to evaluate levels of welfare support and their mental health effects, particularly in austere locations.

Secondary Prevention

Sources of Mental Health Support

12. Effective prevention relies on the ability to intervene effectively to reverse any adverse mental health effects and psychological symptoms. Deployed medical help-

providers appeared to be under-utilised in comparison to other forms of support. Deployed general medical personnel may benefit from training in mental disorder detection and effective mental health interventions.

13. Future studies should be undertaken to assess the differential effects of seeking help from medical and non-medical sources to establish whether greater effort is required to shift the focus of help-seeking from informal to formal medical sources.

14. During deployment, seeking help from both non-medical and medical sources was associated with poorer mental health, suggesting that deployed health and welfare support is utilised by those with substantial mental health symptoms. More research is required to establish the proportion of symptomatic personnel who choose not to access support and what can be done to improve their engagement.

15. Among non-deployed personnel there was a view that mental health support is helpful and necessary which was particularly prevalent among personnel who wanted help but had yet to seek it. Despite such opinions, seeking help from formal military medical sources was viewed as occupational risky. It is therefore suggested that corrective information about the nature, function and effectiveness of military health services may help personnel to make more informed decisions about accessing medical services for mental health support.

Help-seeking, Mental Health Stigmatisation and Barriers to Care

16. Anti-stigma campaigns usually adopt a blanket approach to public health education aimed at all military personnel, however, a more targeted approach using a specific message

aimed at those with higher levels of psychological symptoms may be more appropriate. The effect of such an approach should be assessed in future comparative trials. Related recommendations include:

a. Military stigma reduction strategies should target those who are at the point of becoming mentally unwell and education should seek to enable them to see substantial psychological symptoms as requiring and worthy of help or support.

b. Anti-stigma strategies may best be delivered when military personnel are based in their home unit rather than their deployed location.

c. Although a zero stigma rate may be the ultimate aim of any stigma-reduction campaign, anti-stigma interventions should initially seek to return raised stigma/BTC levels in the unwell to those found among mentally well personnel.

d. Anti-stigma campaigns should seek to encourage the recognition of mental health disorder symptoms in oneself and others and maximum effort should be made to encourage those who misuse alcohol to view it as problematic and undesirable.

e. Education should seek to inculcate and encourage interest in receiving help by describing the potential benefits of support and the nature and function of the effective military mental health services that are available.

f. Willing volunteers who have recovered from a mental ill-health episode may be best placed to deliver education-based stigma reduction strategies.

17. Operational hardiness may be related to raised levels of stigma/BTC where symptomatic personnel attempt to 'keep going' when experiencing psychological symptoms to complete their period of operational deployment. Further studies are required to determine whether such a strategy is used, to what degree, and what the mental health consequences of adopting such a strategy are for deployed personal with greater levels of psychological symptoms.

Alcohol Misuse

18. Alcohol misuse appeared to be widespread among the UK AF personnel who took part in the various surveys that measured alcohol use; unless co-morbid with a mental disorder, help-seeking for such problems was infrequent and mostly confined to non-medical sources. Secondary prevention procedures should be developed to promote treatment engagement by encouraging alcohol misusers to view their drinking as problematic and worthy of intervention. Should help-seeking rates rise as a consequence, further studies are required to establish the optimum intervention for UK military alcohol misusers.

Tertiary Prevention

Mental Healthcare

19. The evaluation of tertiary prevention in the form of deployed mental healthcare using the principles of forward psychiatry suggested that although high rates of immediate return to duty are achieved, a long-term negative occupational outcome will occur for around a third of personnel referred to the FMHT. To assess the specific psychological effects of

implementing forward psychiatry, future studies should be longitudinal in design and should seek to evaluate mental health outcomes while retaining a meaningful measure of military occupational functioning.

20. Personnel with no assigned psychiatric diagnosis were among those evacuated from deployment by the FMHT. It is probably unhelpful to use the medical evacuation route to remove this category of personnel from deployment and it may be that more creative welfare, personnel or discipline-based approaches could be more appropriately used in their management.

21. The deployed healthcare study failed to assess in depth how personnel were managed both during and following return from deployment. In addition, the non-deployed healthcare study outcomes suggested that among the neurotic spectrum disorders, cases of anxiety and depression had the worst occupational outcomes. Future deployment healthcare studies should therefore attempt to evaluate the short and longer-term effects of different forms of support and therapy for a wide range of disorders, not just PTSD and acute stress reaction/disorder.

22. As re-referral was common among respondents in the non-deployed healthcare study and longer-term reduced occupational fitness affected around a third of personnel, military mental health services may require some form of relapse prevention to be put in place post-discharge from the DCMH, particularly for cases of common mental disorder. Future development work in this area should seek to evaluate the impact of introducing such strategies.

23. Future mental healthcare studies should assess in detail the management of cases of deliberate self-harm occurring pre-, post- and during deployment and how such behaviours relate to both short and longer-term occupational adjustment both in the deployed and non-deployed settings.

24. The deployment tertiary prevention study further suggested that those personnel who consulted informally with the FMHT were no more likely to experience a negative short or long term outcomes than those referred through formal routes and were as likely to receive a diagnosis as those arriving through formal routes. Future military healthcare studies may need to contain an element where the mental health and occupational outcomes for military units operating a self-referral policy are compared with those arising from units utilising a formal referral route.

25. Tertiary prevention in the form of mental healthcare was assessed by evaluating data obtained during mental health assessments conducted in community mental health clinics. No direct standardised, valid and reliable mental health measures were gathered. Future longitudinal studies of both non-deployed and deployed mental healthcare would benefit from the inclusion of psychometric measures in addition to the standard clinical interview.

26. A major target for tertiary prevention is alcohol misuse. In the non-deployed healthcare study, most alcohol misuse cases occured in conjunction with mental disorder rather than as cases of primary alcohol disorder. More work is required to identify measures that are effective in identifying and engaging clinically significant alcohol cases in therapy. If such a strategy can be found, effort will be required to identify effective treatment interventions for alcohol misuse.

27. Given that it was the most common diagnostic category in the clinical studies, structured interventions or clinical guidelines for adjustment disorder should be developed as none currently exist. To enable the evaluation of such interventions, adjustment disorder should be categorised according to the severity of presentation.

28. Over half of those referred to the DCMH had previously sought help for a mental health problem. Recurrent mental health referral should be further evaluated in future studies to assess whether it is a true precursor of poorer military functioning; it could then be used as an indicator that a more prolonged period of monitoring, or even early managed discharge may be required post-discharge from the DCMH for those with such a history.

Concluding Remarks

Through a series of progressive investigations, I set out to assess prevention as it relates to military mental health at various stages of deployment. The research focused upon the various strategies currently used by the UK Armed Forces to optimise operational effectiveness by minimising the effects of poor mental health. It is of course self-evident that there are numerous additional supportive strategies and interventions that could have been used in addition to those which I assessed. It is therefore the challenge, as with all research, to seek out and evaluate novel and creative approaches to mental health support. The main immediate challenge is to translate the findings and recommendations of the current research into practice, given that the impact of research is perhaps more important than the findings themselves. One major promising occupational intervention is individual placement and support (IPS) (Bond et al., 2012) which research suggests is an effective occupational intervention for mental illness (Becker et al, 2014) that may be highly relevant to the young

adult population of the UK AF (Bond et al., 2014). There is clearly great scope for extending the current mental health support efforts of the UK AF and it would be wise to seek to ensure that such developments are accompanied by a comprehensive evaluation of their impact among military personnel.

References:

Abraham, A., Easow, J.M., Ravichandren, P., Mushtaq, S., Butterworth, L., & Luty, J. (2010). Effectiveness and confusion of the Time to Change anti-stigma campaign. *The Psychiatrist*, *34*(6), 230-233.

Adler, A.B., Bliese, P.D., McGurk, D., Hoge, C.W., & Castro, C.A. (2009). Battlemind debriefing and Battlemind training as early interventions with soldiers returning from Iraq: randomization by platoon. *Journal of Consulting and Clinical Psychology*, 77, 928–940.

Adler, A.B., & Bartone, P.T. (1999). International survey of military mental health professionals. *Military Medicine*, 164(11), 788-792.

Adler, A.B., Litz, B.T., Castro, C.A., Suvak, M., Thomas, J.L., Burrell, L., McGurk, D., Wright, K.M., & Bliese, P.D. (2008). A group randomized trial of critical incident stress debriefing provided to U.S. peacekeepers. *Journal of Traumatic Stress*, 21, 253–263.

Ahola, K., Vuori, J., Toppinen-Tanner, S., Mutanen, P., & Honkonen, T. (2012). Resource-enhancing group intervention against depression at workplace: who benefits? A randomised controlled study with a 7-month follow-up. *Occupational and Environmental Medicine*. doi:10.1136/oemed-2011-100450

Alvidrez, J., & Azocar, F. (1999). Distressed women's clinic patients: Preferences for mental health treatments and perceived obstacles. *General Hospital Psychiatry*, *21*(5), 340-347.

Anderson, R.J. (2008). Shell shock: an old injury with new weapons. *Molecular Interventions*, *8*(5), 204-218.

Andrews, G. & Jenkins, R. (eds) (1999). Management of Mental Disorders (UK Edition). London: World Health Organization Collaborating Centre for Mental Health and Substance Abuse.

Arends, I., Van Der Klink, J.J., & Bültmann, U. (2010). Prevention of recurrent sickness absence among employees with common mental disorders: design of a cluster-randomised controlled trial with cost-benefit and effectiveness evaluation. *BMC public health*, 10(1), 132. doi:10.1186/1471-2458-10-132.

Ashcroft, M. (2014). The Veterans' Transition Review. Biteback Publishing.

Austin P. (2011). An Introduction to Propensity Score Methods for Reducing the Effects of Confounding in Observational Studies. *Multivariate Behavioral Research,* 46(3), 399–424.

Babor, T.F., Higgins-Biddle J.C., Saunders J.B., & Monteiro M.G. (2001). *The Alcohol Use Disorders Identification Test: Guidelines for use in primary care* (2nd ed.). World Health Organisation, Department of Mental Health and Substance Dependence.

Barnes, J.B., Nickerson, A., Adler, A.B., & Litz, B.T. (2013). Perceived military organizational support and peacekeeper distress: A longitudinal investigation. *Psychological Services*, 10(2), 177-185.

Bartone, P.T., Kelly, D.R., & Matthews, M.D. (2013). Psychological hardiness predicts adaptability in military leaders: A prospective study. *International Journal of Selection and Assessment*, 21(2), 200-210.

Bartone, P.T. (2006). Resilience under military operational stress: Can leaders influence hardiness? *Military Psychology*, *18*(S), S131.

Bayer, J.K., & Peay, M.Y. (1997). Predicting intentions to seek help from professional mental health services. *Australian and New Zealand Journal of Psychiatry*, *31*(4), 504-513.

Becker, D. R., Smith, J., Tanzman, B., Drake, R. E., & Tremblay, T. (2014). Fidelity of supported employment programs and employment outcomes. *Psychiatric* Services, 52(6), 834-836.

Bell, D.B., Bartone, J., Bartone, P.T., Schumm, W.R., Rice, R.E., & Hinson, C. (1997). Helping U.S. Army families cope with the stresses of troop deployment in Bosnia-Herzegovina. Summary report for the Office, Deputy chief of Staff for Personnel Department of the Army.

Benbenishty R. (1991). Combat stress reaction and changes in military medical profile. *Military Medicine*, 156(2), 68-70.

Ben-Zeev, D., Corrigan, P.W., Britt, T.W., & Langford, L. (2012). Stigma of mental illness and service use in the military. *Journal of Mental Health*, *21*(3), 264-273.

Bergström, G., Bodin, L., Hagberg, J., Aronsson, G., & Josephson, M. (2009). Sickness presenteeism today, sickness absenteeism tomorrow? A prospective study on sickness presenteeism and future sickness absenteeism. *Journal of Occupational and Environmental Medicine*, *51*(6), 629-638.

Black C. Working for a Healthier Tomorrow. (2008). TSO (The Stationery Office).

Black, C. (2008). Dame Carol Black's Review of the health of Britain's working age population: Working for a healthier tomorrow. London: The Stationary Office.

Blanchard, E.B., Jones-Alexander, J., Buckley, T.C., & Forneris, C.A. (1996). Psychometric properties of the PTSD Checklist (PCL). *Behaviour Research and Therapy*, *34:* 669–673.

Bliese, P.D., Wright, K.M., Adler, A.B., Cabrera, O., Castro, C.A., & Hoge, C.W. (2008). Validating the primary care posttraumatic stress disorder screen and the posttraumatic stress disorder checklist with soldiers returning from combat. *Journal of consulting and clinical psychology*, *76*(2), 272-281.

Bloom, B.L. (1979). Prevention of mental disorders: Recent advances in theory and practice. *Community Mental Health Journal*, 15(3), 179-191.

Bolton, E.E., Glenn, D.M., Orsillo, S., Roemer, L., & Litz, B.T. (2003). The relationship between self-disclosure and symptoms of posttraumatic stress disorder in peacekeepers deployed to Somalia. *Journal of Traumatic Stress*, *16*(3), 203-210.

Bond, G.R., Drake, R.E., & Becker, D.R. (2012). Generalizability of the Individual Placement and Support (IPS) model of supported employment outside the US. *World Psychiatry*, *11*(1), 32-39.

Bond, G. R., Drake, R. E., & Campbell, K. (2014). Effectiveness of individual placement and support supported employment for young adults. *Early Intervention in Psychiatry*, doi: 10.1111/eip.12175.

Bouchard, S., Guitard, T., Laforest, M., Dumoulin, S., Boulanger, J., & Bernier, F. (2011). The potential of stress management training as a coping strategy for stressors experienced in theater of operation: A systematic review. *Post Traumatic Stress Disorders in a Global Context*. Rijeka (Croatia): InTech, 271-286.

Brailey, K., Vasterling, J.J., Proctor, S. P., Constans, J.I., & Friedman, M.J. (2007). PTSD symptoms, life events, and unit cohesion in US soldiers: baseline findings from the neurocognition deployment health study. *Journal of traumatic stress*, 20(4), 495-503.

Braithwaite, M., Nicholson, G., Thornton, R., Jones, D., & Simpson, R. McLoughin, D., Jenkins, D. (2009). Armed Forces occupational health - a review. *Occupational Medicine*; 59:528–538.

Breslau, N., chilcoat, H.D., Kessler, R.C., & Davis, G.C. (1999). Previous exposure to trauma and PTSD effects of subsequent trauma: results from the Detroit Area Survey of Trauma. *American Journal of Psychiatry*, *156*(6), 902-907.

Brewin, C.R., Andrews, B., Hejdenberg, J., & Stewart, L. (2012). Objective predictors of delayed-onset post-traumatic stress disorder occurring after military discharge. *Psychological Medicine*, *1*(1), 1-8.

Brewin, C.R., Garnett, R., & Andrews, B. (2011). Trauma, identity and mental health in UK military veterans. *Psychological Medicine*, 41(8), 1733-1740.

Bricknell, M.C.M. (1999). Is service with the parachute regiment bad for your health? *Occupational Medicine*, 49(2), 79-84.

Britt, T.W., & McFadden, A.C. (2012). Understanding Mental Health Treatment-Seeking in High Stress Occupations. *Contemporary Occupational Health Psychology: Global Perspectives on Research and Practice*, *2*, 57-73.

Britt, T.W., Greene-Shortridge, T.M., Brink, S., Nguyen, Q.B., Rath, J., Cox, A.L., & Castro, C.A. (2008). Perceived stigma and barriers to care for psychological treatment: Implications for reactions to stressors in different contexts. *Journal of Social and Clinical Psychology*, *27*(4), 317-335.

Britt, T.W., Wright, K.M., & Moore, D. (2012). Leadership as a predictor of stigma and practical barriers toward receiving mental health treatment: A multilevel approach. *Psychological Services*, 9(1), 26-37.

Britt, T.W., Greene-Shortridge, T.M., & Castro, C.A. (2007). The stigma of mental health problems in the military. *Military Medicine, 172*(2), 157-161.

Brown, M.C., Creel, A.H., Engel, C.C., Herrell, R.K., & Hoge, C.W. (2011). Factors associated with interest in receiving help for mental health problems in combat veterans returning from deployment to Iraq. *Journal of Nervous and Mental Disorders*, 199, 797–801.

Brown, J.S., Evans-Lacko, S., Aschan, L., Henderson, M.J., Hatch, S.L., & Hotopf, M. (2014). Seeking informal and formal help for mental health problems in the community: a secondary analysis from a psychiatric morbidity survey in South London. *BMC psychiatry*, *14*(1), 275.

Browne T, Iversen A, Hull L, Workman L, Barker C, Horn O, & Fear N.T. (2008). How do experiences in Iraq affect alcohol use among male UK Armed Forces personnel? *Occupational and Environmental Medicine,* 65(9): 628-633.

Bryan, C.J & Morrow, C.E. (2011). Circumventing mental health stigma by embracing the warrior culture: Lessons learned from the Defender's Edge program. *Professional Psychology: Research and Practice*, 42, 16-23.

Buckman, J.E., Forbes, H.J., Clayton, T., Jones, M., Jones, N., Greenberg, N., & Fear, N.T. (2013). Early Service leavers: a study of the factors associated with premature separation from the UK Armed Forces and the mental health of those that leave early. *The European Journal of Public Health*, 23(3), 410-415.

Budd, F. (1997). Helping the helpers after the bombing in Dhahran: Critical-incident stress services for an air rescue squadron. *Military Medicine*, 162(8), 515-520.

Burdett H, Jones N, Fear N, & Wessely, S. (2011). Early psychosocial intervention following operational deployment: analysis of a free text questionnaire response. *Military Medicine*, 176, 620-625.

Burke, M.M. (2012). Military's new R&R plan doesn't include leaving Afghanistan. *Stars and Stripes*, 18 June.

Bush, K., Kivlahan, D.R., McDonell, M.B., Fihn, S.D., & Bradley, K.A. (1998). The AUDIT alcohol consumption questions (AUDIT-C): an effective brief screening test for problem drinking. *Archives of Internal Medicine, 158*(16), 1789.

Butterworth, P., Leach, L.S., Pirkis, J., & Kelaher, M. (2012). Poor mental health influences risk and duration of unemployment: a prospective study. *Social Psychiatry and Psychiatric Epidemiology*, 47(6), 1013-1021.

Buxton, J.W., Singleton, N., & Melzer, D. (2005). The mental health of early retirees. *Social Psychiatry and Psychiatric Epidemiology*, 40(2), 99-105.

Cable, N., Sacker, A., & Bartley, M. (2008). The effect of employment on psychological health in mid-adulthood: findings from the 1970 British Cohort Study. *Journal of Epidemiology and Community Health*, *62*(5), e10-e10.

Caliendo M and Kopeinig S. Some practical guidance for the implementation of propensity score matching. *Journal of Economic Surveys* 2002; 22: 31–72

Carter, S., Loew, B., Stanley, S., Rhoades, G., & Markman, H. (2011). Relationships Between Soldiers' PTSD Symptoms and Spousal Communication During Deployment. *Journal of Traumatic Stress*, 24(3), 352-355.

Casey Jr, G.W. (2011). Comprehensive soldier fitness: A vision for psychological resilience in the US Army. *American Psychologist*, 66(1), 1-3.

Castro, C.A., & McGurk, D. Non-commissioned officer leadership scale. Walter Reed Army Institute of Research (WRAIR):2004 Washington, DC: WRAIR.

Castro, C.A., Adler, A.B., & Bienvenu, R.V.A human dimensions assessment of the impact of OPTEMPO on the forward-deployed soldier. Walter Reed Army Institute of Research [WRAIR] 1998:Protocol #700. Washingon, DC: WRAIR. NCO Leadership Study 52.

Castro, C.C. (2009). Impact of Combat on the Mental Health and Well-Being of Soldiers and Marines. *Smith College Studies in Social Work*, *79*(3-4), 247-262.

Cattell, R.B. (1966). The scree test for the number of factors. *Multivariate Behavioral Research*, *1*(2), 245-276.

Chan, S.W., & Adams, M. (2014). Service Use, Drop-Out Rate and Clinical Outcomes: A Comparison Between High and Low Intensity Treatments in an IAPT Service. *Behavioural and cognitive psychotherapy*, 1-13, available on CJO2014. doi:10.1017/S1352465813000544.

Cheng, K.G., Ortiz, D.J., Weiss, R.E., Shi, L., Ovalle-Bahamón, R.E., Ernesto, F., & Bing, E.G. (2012). Patterns of alcohol consumption and factors influencing problematic drinking among Angolan soldiers. *Journal of Substance Use*, *17*(2), 138-149.

Cigrang, J.A., Wayne Talcott, G., Tatum, J., Baker, M., Cassidy, D., Sonnek, S., & Smith Slep, A.M. (2014). Impact of Combat Deployment on Psychological and Relationship Health: A Longitudinal Study. *Journal of Traumatic Stress*, 27(1), 58-65.

Clarke-Walper, K., Riviere, L.A., & Wilk, J.E. (2014). Alcohol misuse, alcohol-related risky behaviors, and childhood adversity among soldiers who returned from Iraq or Afghanistan. *Addictive Behaviors*, *39*(2), 414-419.

Claussen, B., Bjorndal, A. & Hjort, P.F. (1993). Health and re-employment in a two year follow up of long term unemployed. *Journal of Epidemiology and Community Health*, 47, 14–18

Clement, S., Brohan, E., Jeffery, D., Henderson, C., Hatch, S. L., & Thornicroft, G. (2012). Development and psychometric properties the Barriers to Access to Care Evaluation scale (BACE) related to people with mental ill health. *BMC psychiatry*, *12*(1), 36.

Cohen, S.P., Brown, C., Kurihara, C., Plunkett, A., Nguyen, C., & Strassels, S.A. (2010). Diagnoses and factors associated with medical evacuation and return to duty for service members participating in Operation Iraqi Freedom or Operation Enduring Freedom: a prospective cohort study. *Lancet, 375*:301-309.

Conrad, F.E., Barry, J.S., & Patterson, P.H. (1976). Stress, adjustment, and attrition at West Point: Clinical aspects. *Military Medicine*, 141(12), 864-867.

Cooper, A.E., Corrigan, P. W., & Watson, A.C. (2003). Mental illness stigma and care seeking. *The Journal of Nervous and Mental Disease*, *191*(5), 339-341.

Cornish, M.A., Thys, A., Vogel, D.L., & Wade, N.G. (2014). Post-deployment difficulties and help seeking barriers among military veterans: Insights and intervention strategies. *Professional Psychology: Research and Practice*, *45*(6), 405.

Corrigan, P.W. (2000). Mental Health Stigma as a Social Attribution: Implications for Research Methods and Attitude Change. *Clinical Psychology – Science and Practice, 7,* 48-67.

Corrigan, P.W., & Watson, A.C. (2002). Understanding the impact of stigma on people with mental illness. *World Psychiatry*, *1*(1), 16-20.

Couser, G.P. (2008). Challenges and opportunities for preventing depression in the workplace: a review of the evidence supporting workplace factors and interventions. *Journal of Occupational and Environmental Medicine*, *50*(4), 411-427.

Crandall, C.S., & Moriarty, D. (1995). Physical illness stigma and social rejection. British *Journal of Social Psychology*, 34(1), 67-83.

Creamer, M., & Forbes, D. (2004). Treatment of posttraumatic stress disorder in military and

veteran populations. *Psychotherapy: Theory, Research, Practice, Training*, *41*(4), 388-398.

Cunningham, J.A., & Breslin, F.C. (2004). Only one in three people with alcohol abuse or dependence ever seek treatment. *Addictive Behaviors*, *29*(1), 221-223.

Dalky, H.F. (2012). Mental Illness Stigma Reduction Interventions Review of Intervention Trials. *Western Journal of Nursing Research*, *34*(4), 520-547.

Davidovitz, R., Mikulincer, M., Shaver, P.R., Izsak, R., & Popper, M. (2007). Leaders as attachment figures: leaders' attachment orientations predict leadership-related mental representations and followers' performance and mental health. *Journal of Personality and Social Psychology*, 93(4), 632-650.

Davydov, D.M., Stewart, R., Ritchie, K., & Chaudieu, I. (2010). Resilience and mental health. *Clinical Psychology Review*, 30(5), 479-495.

de Bloom J., Geurts S.A.E., Taris, T.W., Sonnentag, S., de Weerth, C., & Kompier, M.A.J. (2010). Effects of vacation from work on health and well-being: Lots of fun, quickly gone. *Work & Stress*, 24(2):196-216.

de Lusignan, S., Chan, T., Parry, G., Dent-Brown, K., & Kendrick, T. (2012). Referral to a new psychological therapy service is associated with reduced utilisation of healthcare and sickness absence by people with common mental health problems: a before and after comparison. *Journal of Epidemiology and Community Health*, 66:e10. doi:10.1136/jech.2011.139873

Deahl, M., Srinivasan, M., Jones, N., Thomas, J., Neblett, C., & Jolly, A. (2002). Preventing psychological trauma in soldiers : the role of operational stress training and psychological debriefing. *British Journal of Medical Psychology*, 73, 77–85.

Deahl, M.P., Srinivasan, M., Jones, N., Neblett, C., & Jolly, A. (2001). Evaluating psychological debriefing: are we measuring the right outcomes? *Journal of Traumatic Stress*, 14, 527–529.

Dean, K., Stevens, H., Mortensen, P.B., Murray, R.M., Walsh, E., & Pedersen, C.B. (2010). Full spectrum of psychiatric outcomes among offspring with parental history of mental disorder. *Archives of General Psychiatry*, 67(8), 822.

Defence Statistics. Annual Personnel report attachment. Retrieved from: https://www.gov.uk/government/statistics/uk-armed-forces-quarterly-personnel-report-2014. Retrieved Apr 2014.

Defence Statistics - Annual Medical Discharges in the UK Regular Armed Forces 2008/09 - 2012/13. Retrieved from: https://www.gov.uk/government/publications/uk-service-personnel-medical-discharges-financial-year-ending-2012.

Defence Statistics (Health) 2014. UK Armed Forces mental health: Annual Summary & Trends Over Time, 2007/08 - 2013/14. Bristol: MOD.

Department of the Army. Operation Iraqi Freedom (OIF) Mental Health Advisory Team (MHAT) Report December 2003 retrieved on 7 November 2012 from

http://www.pbs.org/wgbh/pages/frontline/shows/heart/readings/mhat.pdf

Dickstein, B.D., McLean, C.P., Mintz, J., Conoscenti, L.M., Steenkamp, M.M., Benson, T.A., & Litz, B.T. (2010). Unit cohesion and PTSD symptom severity in Air Force medical personnel. *Military Medicine*, 175(7), 482-486.

Dodgen D., LaDue L.R., & Kaul R.E. (2002). Coordinating a local response to a national tragedy: community mental health in Washington, DC after the Pentagon attack. *Military Medicine*, 167(9 Suppl), 87-9.

Du Preez, J., Sundin, J., Wessely, S., & Fear, N.T. (2012). Unit cohesion and mental health in the UK Armed Forces. *Occupational Medicine*, 62, 47-53.

Eaton, W.W., Neufeld, K., Chen, L.S., & Cai, G. (2000). A comparison of self-report and clinical diagnostic interviews for depression: diagnostic interview schedule and schedules for clinical assessment in neuropsychiatry in the Baltimore epidemiologic catchment area follow-up. *Archives of General Psychiatry*, *57*(3), 217-222.

Eisen, S.V. Schultz, M.R., Vogt, D., Glickman, M.E., Elwy, A.R., Drainoni, M.L. & Martin, J. (2012). Mental and physical health status and alcohol and drug use following return from deployment to Iraq or Afghanistan. *American Journal of Public Health*, 102(S1), S66-S73.

Elnitsky, C.A., Chapman, P.L., Thurman, R.M., Pitts, B.L. Figureley, C. & Unwin, B. (2013). Gender differences in combat medic mental health services utilization, barriers, and stigma. *Military Medicine*, 178(7) 775-784.

Engelhard, I.M., & McNally, R.J. (2014). Metacognitive appraisal of memory inconsistency for traumatic events in Dutch veterans. Memory, 1-9. DOI: 10.1080/09658211.2014.942669

Erbes, C.R., Polusny, M.A., MacDermid, S., & Compton, J.S. (2008). Couple therapy with combat veterans and their partners. *Journal of Clinical Psychology*, 64(8), 972-983.

Evans-Lacko, S., Rose, D., Little, K., Flach, C., Rhydderch, D., Henderson, C., & Thornicroft, G. (2011). Development and psychometric properties of the reported and intended behaviour scale (RIBS): a stigma-related behaviour measure. *Epidemiology and Psychiatric Sciences, 20*(3), 263-271.

Fear NT, Seddon R, Jones N. Greenberg N & Wessely S. (2012). Does anonymity increase the reporting of mental health symptoms? *BMC Public Health,* 12:797 doi:10.1186/1471-2458-12-797.

Fear, N.T., Iversen, A., Meltzer, H., Workman, L., Hull, L., Greenberg, N., Barker, C., Browne, T., Earnshaw, M., Horn, O., Jones., M., Murphy, D., Rona, R.J., Hotopf, M., & Wessely, S. (2007). Patterns of drinking in the UK Armed Forces. *Addiction*, 102(11), 1749-1759.

Fear, N.T., Jones, M., Murphy, D., Hull, L., Iversen, A., Coker, B., Machell, L, Sundin, J., Woodhead, C., Jones, N., Greenberg, N., Landau, S., Dandeker, C., Rona, R.J., Hotopf, M., Wessely, S. (2010). What are the consequences of deployment to Iraq and Afghanistan on the mental health of the UK Armed Forces: a cohort study. *Lancet, 375,* 1783-1797.

Fear, N.T., Seddon, R., Jones, N., Greenberg, N., & Wessely, S. (2012). Does Anonymity Increase the Reporting of Mental Health Symptoms? *Journal of Epidemiology and Community Health*, 66(Suppl 1), A35-A36.

Fear, N.T., Ward, V.R., Harrison, K., Davison, L., Williamson, S., & Blatchley, N.F. (2009). Suicide among male regular UK Armed Forces personnel, 1984–2007. *Occupational and Environmental Medicine*, 66(7), 438-441.

Ferdos, G., & Seyed-Hossein, S. (2007). The effectiveness of problem solving skills in decreasing PTSD symptoms in survivors of the Bam earthquake. *Pakistan Journal of Medical Sciences*, 23(5), 736-740

Ferrie, J.E., Kivimäki, M., Westerlund, H., Head, J., Melchior, M., Singh-Manoux, A., & Vahtera, J. (2011). Differences in the association between sickness absence and long-term sub-optimal health by occupational position: a 14-year follow-up in the GAZEL cohort. *Occupational and Environmental Medicine*, 68(10), 729-733.

Fertout, M., Jones, N., & Greenberg, N. (2011[b]). Third location decompression for Individual Augmentees after a military deployment. *Occupational Medicine* (Lond), 62, 188-195.

Fertout, M., Jones, N., Greenberg, N., Mulligan, K., Knight, T., & Wessely, S. (2011). A review of United Kingdom Armed Forces' approaches to prevent post-deployment mental health problems. *International Review of Psychiatry*, 23(2), 135-143.

Field, A. (2013). *Discovering statistics using IBM SPSS statistics*. Sage.

Figureley, C.R., & Nash, W.P. (Eds.). (2006). Combat stress injury: Theory, research, and management (34). Brunner-Routledge.

Fink, D.S., Gallaway, M.S., & Millikan A.M. (2013). Assessment of subthreshold and developing behavioral health concerns among U.S. army soldiers. *Military Medicine*, 178, 1188-95.

Flanagan, S.C., Kotwal, R.S., & Forsten, R.D. (2012). Preparing soldiers for the stress of combat. *Journal of Special Operations Medicine: a Peer Reviewed Journal for SOF Medical Professionals*, 12(2), 33-41.

Foran H.M., Adler A.B., McGurk D. & Bliese P.D.. (2012). Soldiers' perceptions of resilience training and postdeployment adjustment: Validation of a measure of resilience training content and training process. *Psychological Services*, 9, 390-403.

Foran, H.M., Garber, B.G., Zamorski, M.A., Wray, M., Mulligan, K., Greenberg, N. et al. (2013). Postdeployment military mental health training: Cross-national evaluations. *Psychological Services*, 10, 152-160.

Forbes, H. J., Boyd, C.F., Jones, N., Greenberg, N., Jones, E., Wessely, S. & Fear, N.T. (2013). Attitudes to mental illness in the UK Military: A comparison with the general population. *Military Medicine*, *178*(9), 957-965.

Forbes, H., Jones, N., Woodhead, C., Greenberg, N., Harrison, K., White, S., & Fear, N.T. (2012). What are the effects of having an illness or injury whilst deployed on post

deployment mental health? A population based record linkage study of UK Army personnel who have served in Iraq or Afghanistan. *BMC Psychiatry*, *12*(1), 178. doi:10.1186/1471-244X-12-178

Forbes, H.J., Fear, N.T., Iversen, A., & Dandeker, C. (2011). The mental health of UK Armed Forces personnel: the impact of Iraq and Afghanistan. *The RUSI Journal*, 156(2), 14-20.

Frappell-Cooke, W., Gulina, M., Green, K., Hacker Hughes, J., & Greenberg, N. (2010). Does trauma risk management reduce psychological distress in deployed troops? *Occupational Medicine*, 60(8), 645-650.

Ganster, D.C., & Victor, B. (2011). The impact of social support on mental and physical health. *British Journal of Medical Psychology*, 61(1), 17-36.

Garber, B.G., and Zamorski, M.A. (2012). Evaluation of a Third-Location Decompression Program for Canadian Forces Members Returning From Afghanistan. *Military Medicine*, 177(4), 397-403.

Garber, B.G., Zamorski, M.A., & Jetly, R. (2012). Mental health of Canadian Forces members while on deployment to Afghanistan. *Canadian Journal of Psychiatry, 57*(12), 736-744.

Garvey Wilson, A.L., Messer, S.C., & Hoge, C.W. (2009). U.S. military mental health care utilization and attrition prior to the wars in Iraq and Afghanistan. *Social Psychiatry and Psychiatric Epidemiology*, 44: 473–481.

Gilbert D. Abdullah J. (2004). Holiday-taking and the sense of well-being. *Annals of Tourism Research*, 31(1):103-121.

Goetzel, R.Z., Long, S.R., Ozminkowski, R.J., Hawkins, K., Wang, S., & Lynch, W. (2004). Health, absence, disability, and presenteeism cost estimates of certain physical and mental health conditions affecting US employers. *Journal of Occupational and Environmental Medicine*, 46(4), 398-412.

Golberstein, E., Eisenberg, D., & Gollust, S.E. (2009). Perceived stigma and help-seeking behavior: longitudinal evidence from the Healthy Minds study. *Psychiatric Services (Washington, DC)*, *60*(9), 1254-1256.

Goldberg D and Williams P. A User's Guide to the General Health Questionnaire. (1988); Windsor, UK: NFER-Nelson.

Goldberg D.P., Gater R, Sartorius N, Ustun, T.B., Piccinelli, M., Gureje, O., & Rutter, C. (1997). The validity of two versions of the GHQ in the WHO study of mental illness in general health care. *Psychological Medicine*, 27: 191–197.

Gould, M., Adler, A., Zamorski, M., Castro, C., Hanily, N., Steele, N., Kearney, S., & Greenberg, N. (2010). Do stigma and other perceived barriers to mental health care differ across Armed Forces? *Journal of the Royal Society of Medicine*, 103, 148-156. doi: DOI 10.1258/jrsm.2010.090426

Gould, M., Sharpley, J., & Greenberg, N. (2008). Patient characteristics and clinical activities at a British military department of community mental health. *Psychiatric Bulletin*, 32, 99-102.

Green, J.M., Wood, A.J., Kerfoot, M.J., Trainor, G., Roberts, C., Rothwell, J., & Harrington, R. (2011). Group therapy for adolescents with repeated self-harm: randomised controlled trial with economic evaluation. *British Medical Journal*, 342:d682.

Greenberg, N., Iversen, A., Hull, L., Bland, D., & Wessely, S. (2008). Getting a peace of the action: measures of post traumatic stress in UK military peacekeepers. *Journal of the Royal Society of Medicine*, 101(2), 78-84.

Greenberg, N., Langston, V., Everitt, B., Iversen, A., Fear, N.T., Jones, N., & Wessely, S. (2010). A cluster randomized controlled trial to determine the efficacy of TRiM (Trauma Risk Management) in a military population. *Journal of Traumatic Stress*, 23, (4), 430-436.

Greenberg, N., Langston, V., Fear, N.T., Jones, M., & Wessely, S. (2009). An evaluation of stress education in the Royal Navy. *Occupational Medicine*, 59(1), 20-24.

Greenberg, N., Langston, V., Iversen, A.C., & Wessely, S. (2011[a]). The acceptability of Trauma Risk Management within the UK Armed Forces. *Occupational Medicine, 61*(3), 184-218.

Greenberg, N., Jones, E., Jones, N., Fear, N.T., & Wessely, S. (2011). The injured mind in the UK Armed Forces. *Philosophical Transactions of the Royal Society B: Biological Sciences*, *366*(1562), 261-267.

Greenberg, N., Thomas, S.L., Iversen, A., Unwin, C., Hull, L., & Wessely, S. (2003). Do military peacekeepers want to talk about their experiences? Perceived psychological support of UK military peacekeepers on return from deployment. *Journal of Mental Health*, *12*(6), 565-573.

Greene, T., Buckman, J., Dandeker, C., & Greenberg, N. (2010). How communication with families can both help and hinder service members' mental health and occupational effectiveness on deployment. *Military Medicine*,175(10), 745-749.

Gubata, M.E., Urban, N., Cowan, D.N., & Niebuhr, D.W. (2013). A prospective study of physical fitness, obesity, and the subsequent risk of mental disorders among healthy young adults in army training. *Journal of Psychosomatic Research*, 75, 43-48.

Gulliver, A., Griffiths K.M., Christensen, H. (2010) Perceived barriers and facilitators to mental health help-seeking in young people: a systematic review. *BMC Psychiatry*, 10(1):113.

Gustafsson, K., & Marklund, S. (2011). Consequences of sickness presence and sickness absence on health and work ability: a Swedish prospective cohort study. *International Journal of Occupational Medicine and Environmental Health*, 24(2), 153-165.

Hacker Hughes, J.G.H., Earnshaw, M., Greenberg, N., Eldridge, R., Fear, N.T., French, C., Deahl, M., & Wessely, S. (2008). The Use of Psychological Decompression in Military Operational Environments. *Military Medicine*, 173(6), 534-538.

Hackman, J.R., & Wageman, R. (2007). Asking the right questions about leadership: discussion and conclusions. *American Psychologist*, 62(1), 43-47.

Harman, D.R., Hooper, T.I., & Gackstetter, G.D. (2005). Aeromedical evacuations from Operation Iraqi Freedom: a descriptive study. *Military Medicine*, *170*(6), 521-527.

Harpaz-Rotem, I., Rosenheck, R.A., Pietrzak, R.H., & Southwick, S.M. (2014). Determinants of prospective engagement in mental health treatment among symptomatic Iraq/Afghanistan veterans. *The Journal of Nervous and Mental Disease*, *202*(2), 97-104.

Harvey, S.B., Henderson, M., Lelliott, P., & Hotopf M. (2009). Mental health and employment: much work still to be done. *British Journal of Psychiatry*, 194, 201–3

Hasin, D.S., Stinson, F.S., Ogburn, E., Grant B.F. (2007). Prevalence, correlates, disability, and comorbidity of DSM-IV alcohol abuse and dependence in the United States: results from the National Epidemiologic Survey on Alcohol and Related Conditions. *Archives of General Psychiatry*, 64: 830–42.

Hatzenbuehler, M.L., Phelan, J.C., & Link, B.G. (2013). Stigma as a fundamental cause of population health inequalities. *American Journal of Public Health*, *103*(5), 813-821.

Hawton, K., Harriss, L., Casey, D., Simkin, S., Harrison, K., Bray, I., & Blatchley, N. (2009). Self-harm in UK Armed Forces personnel: descriptive and case–control study of general hospital presentations. *The British Journal of Psychiatry*, *194*(3), 266-272.

Hawton, K., Saunders, K., Topiwala, A., & Haw, C. (2013). Psychiatric disorders in patients presenting to hospital following self-harm: a systematic review. *Journal of Affective Disorders*, *151*(3), 821-830.

Hayton, J. (2004). Reducing Medical Downgrading In A High Readiness Royal Marine Unit. *Journal of the Royal Army Medical Corps*, 150: 164-167.

Health Work and Wellbeing: Baseline indicators report. (2010). http://www.dwp.gov.uk/docs/hwwb-baseline-indicators.pdf

Heather, N. (2014). The efficacy-effectiveness distinction in trials of alcohol brief intervention. *Addiction Science and Clinical Practice*, *9*, 13.

Heinrich, C., Maffioli, A., & Vazquez, G. (2010). A primer for applying propensity-score matching. Inter-American Development Bank.

Heltemes, K.J., Clouser, M.C., Macgregor, A.J., Norman, S.B., & Galarneau, M.R. (2014). Co-occurring mental health and alcohol misuse: Dual disorder symptoms in combat injured veterans, *Addictive Behaviors*, 39(2), 392-398.

Henderson, M., Harvey, S.B., Overland, S., Mykeltun, A., & Hotopf, M. (2011). Work and common psychiatric disorders. *Journal of the Royal Society of Medicine*, 104(5), 198-207.

Henderson, M., Glozier, N., & Elliott, K.H. (2005). Long term sickness absence: is caused by common conditions and needs managing. *British Medical Journal*, 330(7495), 802-803.

Henderson, M., Stansfeld, S., & Hotopf, M. (2013). Self-rated health and later receipt of work-related benefits: evidence from the 1970 British Cohort Study. *Psychological Medicine*, 43(8), 1755-1762.

Hines, L. A., Goodwin, L., Jones, M., Hull, L., Wessely, S., Fear, N.T., & Rona, R.J. (2014). Factors Affecting Help Seeking for Mental Health Problems After Deployment to Iraq and Afghanistan. *Psychiatric Services*, 65(1), 98-105.

Hines, L.A., Jawahar, K., Wessely, S., & Fear, N.T. (2013). Self-harm in the UK military. *Occupational medicine*, doi: 10.1093/occmed/kqt065

Hoge, C.W., Castro, C.A, Messer, A.C., McGurk, D., Cotting, D.I., & Koffman, R.L. (2004). Combat duty in Iraq and Afghanistan, mental health problems and barriers to care. *The New England Journal of Medicine*, 351(1):13-22.

Hoge, C.W., Grossman, S.H., Auchterlonie, J.L., Riviere, L.A., Milliken, C.S., & Wilk, J. E. (2014). PTSD Treatment for Soldiers After Combat Deployment: Low Utilization of Mental Health Care and Reasons for Dropout. *Psychiatric Services* (in Advance).

Hoge, C.W., Auchterlonie, J.L., & Milliken, C.S. (2006). Mental health problems, use of mental health services, and attrition from military service after returning from deployment to Iraq or Afghanistan. *JAMA*, 295(9), 1023-1032.

Hoge, C.W., Castro, C.A., Messer, S.C., McGurk, D., Cotting, D.I., & Koffman, R.L. (2004). Combat duty in Iraq and Afghanistan, mental health problems, and barriers to care. *New England Journal of Medicine*, 351, 13-22.

Hoglund, M.W., & Schwartz, R.M. (2014). Mental health in deployed and nondeployed veteran men and women in comparison with their civilian counterparts. *Military Medicine*, 179(1), 19-25.

Holbrook, T.L., Galarneau, M.R., Dye, J.L., Quinn, K. & Dougherty, A.L. (2010). Morphine use after combat injury in Iraq and post-traumatic stress disorder. *New England Journal of Medicine*, 362, 110-117.

Hotopf, M., David, A. S., Hull, L., Ismail, K., Palmer, I., Unwin, C., & Wessely, S. (2003). The health effects of peace-keeping in the UK Armed Forces: Bosnia 1992-1996. Predictors of psychological symptoms. *Psychological Medicine*, 33(1), 155-162.

Hotopf, M.; Hull, L., Fear, N.; Browne, T.; Horn, O.; Iversen, A.; Jones, M.; Murphy, D.; Bland, D.; Earnshaw, M.; Greenberg, N.; Hacker-Hughes, J.; Tate, R.; Dandeker, C.; Rona, R.; Wessely S. (2006). The health of UK military personnel who deployed to the 2003 Iraq war: a cohort study. *Lancet, 36*, 1731-1741.

Hourani, L.L., Council, C.L., Hubal, R.C., & Strange, L.B. (2011[a]). Approaches to the primary prevention of posttraumatic stress disorder in the military: a review of the stress control literature. *Military Medicine*, 176(7), 721-730.

Hourani, L.L., Kizakevich, P.N., Hubal, R., Spira, J., Strange, L.B., Holiday, D.B., & McLean, A.N. (2011[b]). Predeployment Stress Inoculation Training For Primary Prevention Of Combat-Related Stress Disorders. *Journal of CyberTherapy & Rehabilitation*,4(1).

Hourani L.L., Williams T.V. & Kress A.M.. (2006). Stress, mental health, and job performance among active duty military personnel: Findings from the 2002 department of defense health-related behaviors survey. *Military Medicine*, 171(9), 849-856.

Hung, B. (2007). Behavioral health activity and workload in the Iraq theater of operations. *US Army Medical Department Journal*, 39-42.

HSE RR772. Offshore Working Time in Relation to Performance, Health and Safety. www.hse.gov.uk/research/rrpdf/rr772.pdf.

http://www.scotsman.com/news/uk/marines-in-jail-on-assault-charge-1-692290. Accessed 17 July 2014.

Information regarding the post operational screening trial can be retrieved at http://www.kcl.ac.uk/kcmhr/research/kcmhr/post.aspx

Ismail, K., Everitt, B., Blatchley, N., Hull, L., Unwin, C., David, A., & Wessely, S. (1999). Is there a Gulf War syndrome? *Lancet, 353*, 179–182.

Isserlin, L., Zerach, G., & Solomon, Z. (2008). Acute stress responses: A review and synthesis of ASD, ASR, and CSR. *American Journal of Orthopsychiatry*, 78(4):423–429.

Iversen, A.C., Fear, N.T., Ehlers, A., Hacker Hughes, J., Hull, L., Earnshaw, M., Greenberg, N., Rona, R., Wessely, S., Hotopf, M. (2008). Risk factors for post-traumatic stress disorder among UK Armed Forces personnel. *Psychological Medicine*, 29, 1-12

Iversen, A.C., van Staden, L., Hacker Hughes, J., Greenberg, N., Hotopf, M., Rona, R.J., Thornicroft, G., Wessely, S., & Fear, N.T. (2011). The stigma of mental health problems and other barriers to care in the UK Armed Forces. *BMC Health Services Research*, 11:31, doi:10.1186/1472-6963-11-31.

Iversen, A.C., van Staden, L., Hacker-Hughes, J.H., Browne, T., Hull, L., Hall, J., & Fear, N.T. (2009). The prevalence of common mental disorders and PTSD in the UK military: using data from a clinical interview-based study. *BMC Psychiatry*, 9(1), 68.

Jakupcak, M., Blais, R.K., Grossbard, J., Garcia, H., & Okiishi, J. (2014). "Toughness" in association with mental health symptoms among Iraq and Afghanistan war veterans seeking Veterans Affairs health care. *Psychology of Men & Masculinity*, 15(1), 100-104.

Jarrett T. (2008). Warrior Resilience Training in Operation Iraqi Freedom: combining rational emotive behavior therapy, resiliency, and positive psychology. *US Army Medical Department Journal*, 32-8.

Joint Mental Health Advisory Team 7 (J-MHAT 7) Operation Enduring Freedom 2010 Afghanistan Office of The Surgeon General United States Army Medical Command and Office of the Command Surgeon HQ, USCENTCOM 2011.

Jokela, M., Ferrie, J.E., Gimeno, D., Chandola, T., Shipley, M.J., Head, J., & Kivimäki, M. (2010). From midlife to early old age: health trajectories associated with retirement. *Epidemiology*, 21(3), 284.

Johnson, D.C., Thom, N.J., Stanley, E.A., Haase, L., Simmons, A.N., Pei-an, B.S., & Paulus, M.P. (2014). Modifying Resilience Mechanisms in At-Risk Individuals: A Controlled Study of Mindfulness Training in Marines Preparing for Deployment. *American Journal of Psychiatry*, 171(8), 844-853.

Johnson, E.M., & Coles, M.E. (2013). Failure and Delay in Treatment-Seeking Across Anxiety Disorders. *Community Mental Health Journal*, *49*(6), 668-674.

Johnston, S.L., & Dipp, R.D. (2009). Support of marines and sailors returning from combat: a comparison of two different mental health models. *Military Medicine*, 174(5), 455-459.

Joint Services Publication (JSP) Number 770 (Tri-Service Operational and Non-operational Welfare Support). *HM Stationary Office.*

Joint Services Publication Number 770, Part 2, Chapter 3 – Tri Service operational and non-operational welfare policy. *HM Stationary Office.*

Jones, D.E., Perkins, K., Cook, J.H., & Ong, A.L. (2008). Intensive coping skills training to reduce anxiety and depression for forward-deployed troops. *Military Medicine*, 173(3), 241-246.

Jones E, Fear N.T. (2011). Alcohol use and misuse within the military: A review *International Review of Psychiatry*, 23:166-172.

Jones, E., & Wessely, S. (2003). "Forward Psychiatry" in the military: Its origins and effectiveness. *Journal of Traumatic Stress*, 16(4), 411–419.

Jones, E., Thomas, A., & Ironside, S. (2007). Shell shock: an outcome study of a First World War 'PIE' unit. *Psychological Medicine*, *37*(2), 215-224.

Jones, E., Hyams, K.C., & Wessely, S. (2003). Review: Screening for vulnerability to psychological disorders in the military: an historical survey. *Journal of Medical Screening*, *10*(1), 40-46.

Jones, N., Twardzicki, M., Ryan, J., Jackson, T., Fertout, M., Henderson, C., & Greenberg, N. (2014). Modifying attitudes to mental health using comedy as a delivery medium. *Social Psychiatry and Psychiatric Epidemiology*, *49*(10), 1667-1676.

Jones, N., Burdett, H., Wessely, S. & Greenberg, N. (2011). The subjective utility of early psychosocial interventions following combat deployment *Occupational Medicine,* 61(2), 102-107.

Jones, N., Fear, N.T., Greenberg, N., Hull, L., &Wessely, S. (2009). Occupational outcomes in soldiers hospitalized with mental health problems. *Occupational Medicine*, 59, 459-465.

Jones, N., Fear, N.T., Jones, M., Wessely, S., & Greenberg, N. (2010). Long-term military work outcomes in soldiers who become mental health casualties when deployed on operations. *Psychiatry*, 73(4), 352-64.

Jones, N., Mitchell, P., Clack, J., Fertout, M., Fear, N. T., Wessely, S., & Greenberg, N. (2013). Mental health and psychological support in UK Armed Forces personnel deployed to Afghanistan in 2010 and 2011. *The British Journal of Psychiatry*, 204(2):157-62.

Jones, N., Roberts, P., & Greenberg, N. (2003). Peer-group risk assessment: a post-traumatic management strategy for hierarchical organizations. *Occupational Medicine*, 53, 469–475

Jones, N., Seddon, R., Fear, N.T., McAllister, P., Wessely, S., & Greenberg, N. (2012). Leadership, Cohesion, Morale, and the Mental Health of UK Armed Forces in Afghanistan. *Psychiatry*, 75(1), 49-59.

Jones, N., Jones, M., Fear, N.T., Fertout, M., Wessely, S., & Greenberg, N. (2013). Can mental health and readjustment be improved in UK military personnel by a brief period of structured postdeployment rest (third location decompression)? *Occupational and*

Environmental Medicine, *70*(7), 439-445.

Jones, N., Wink, P., Brown, A.B., Berrecloth, D., Abson, E., Doyle, J., Fear, N.T., Wessely, S. & Greenberg, N. (2011). A clinical follow-up study of reserve forces personnel treated for mental health problems following demobilisation. *Journal of Mental Health, 20*: 136-145.

Jorm, A.F. (2000). Mental health literacy. Public knowledge and beliefs about mental disorders, *The British Journal of Psychiatry*, *177*(5), 396-401.

JSP 770, Pt2, Ch 3 – Tri Service Operational and non-operational welfare policy. *HM Stationary Office.*

Kaiser, H.F. (1960). The application of electronic computers to factor analysis. *Educational and Psychological Measurement*, 20:141-151.

Keeling, M., Knight, T., Sharp, D., Fertout, M., Greenberg, N., Chesnokov, M., & Rona, R.J. (2012). Contrasting beliefs about screening for mental disorders among UK military personnel returning from deployment to Afghanistan. *Journal of Medical Screening*, 1–6 DOI: 10.1258/jms.2012.012054

Keller, R.T., Greenberg, N. Bobo, W.V., Roberts, P., Jones, N., & Orman, D.T. (2005). Soldier Peer Mentoring Care and Support: Bringing Psychological Awareness to the Front. *Military Medicine*, 170(5), 355-361.

Kessler, R. C. (2000). Posttraumatic stress disorder: the burden to the individual and to society. *Journal of Clinical Psychiatry*.

Kessler, R.C., Berglund, P.A., Bruce, M.L., Koch, R., Laska, E.M., Leaf, P.J. et al. (2001) The Prevalence and Correlates of Untreated Mental Illness. *Health Services Research*, *36,* 987-1007.

Kim, P.Y., Britt, T.W., Klocko, R.P., Riviere, L.A., Adler, A.B. Stigma, negative attitudes about treatment, and utilization of mental health care among soldiers. *Military Psychology*. 2011; 23(1):65-81.

Kim, P., Thomas, J., Wilk, J., Castro, C., & Hoge, C. (2010). Stigma, barriers to care, and use of mental health services among active duty and National Guard soldiers after combat. *Psychiatric Services*, 61(6), 582-588.

King, A. (2013). The Combat Soldier: Infantry Tactics and Cohesion in the Twentieth and Twenty-first Centuries. Oxford University Press.

Kiszely, J. (2006). Learning about counter-insurgency. *The RUSI Journal*, 151(6), 16-21.

Knobloch, L.K., & Theiss, J.A. (2012). Experiences of US military couples during the post-

deployment transition Applying the relational turbulence model. *Journal of Social and Personal Relationships*, *29*(4), 423-450.

Knudsen, A.K., Øverland, S., Hotopf, M., & Mykletun, A. (2012). Lost working years due to mental disorders: An analysis of the Norwegian disability pension registry. *PloS one*, 7(8), e42567.

Kowalski, J.T., Hauffa, R., Jacobs, H., Hollmer, H., Gerber, W.D., & Zimmermann, P. (2012). Deployment-related stress disorder in German soldiers. *Deutsches Arzteblatt International*, 109(35-36), 569-575.

Kushner, M.G., & Sher, K.J. (1989). Fear of psychological treatment and its relation to mental health service avoidance. *Professional Psychology: Research and Practice*, *20*(4), 251-257.

Land Command Standing Order No. 3209. Land post operational stress management (POSM) 2006.

Langston, V., Gould, M., & Greenberg, N. (2007). Culture: what is its effect on stress in the military. *Military Medicine, 172*, 931-5.

Larson, G.E., Hammer, P.S., Conway, T.L., Schmied, E.A., Galarneau, M R., Konoske, P., & Johnson, D.C. (2011). Pre-deployment and in-theater diagnoses of American military personnel serving in Iraq. *Psychiatric Services*, *62*(1), 15-21.

Larson, G.E., Highfill-McRoy, R.M., & Booth-Kewley, S. (2008). Psychiatric diagnoses in historic and contemporary military cohorts: combat deployment and the healthy warrior effect. *American Journal of Epidemiology*, *167*(11), 1269-1276.

Larson, M.J., Mohr, B.A., Adams, R.S., Wooten, N.R., & Williams, T.V. (2014). Missed opportunity for alcohol problem prevention among army active duty service members postdeployment. *American Journal of Public Health*, 104, 1402-12.

Layard, R., Clark, D., Knapp, M., & Mayraz, G. (2007) Cost benefit analysis of psychological therapy. *National Institute for Economic Review*, 202, 90-8.

LeardMann, C.A., Smith, T.C., Smith, B., Wells, T.S., & Ryan, M.A. (2009). Baseline self reported functional health and vulnerability to post-traumatic stress disorder after combat deployment: prospective US military cohort study. *British Medical Journal*, 338:b1273.

Lester, P.B., Harms, P.D., Herian, M.N., Krasikova, D.V., & Beal, S.J. (2011[b]). The Comprehensive Soldier Fitness Program Evaluation. Report 3: Longitudinal Analysis of the Impact of Master Resilience Training on Self-Reported Resilience and Psychological Health Data. TKC GLOBAL SOLUTIONS LLC ANCHORAGE AK.

Lester, P.B., McBride, S., Bliese, P.D., & Adler, A.B. (2011[a]). Bringing science to bear: an empirical assessment of the Comprehensive Soldier Fitness program. *American Psychologist*, 66(1), 77-81.

Lester, P., Saltzman, W.R., Woodward, K., Glover, D., Leskin, G.A., Bursch, B., & Beardslee, W. (2012). Evaluation of a family-centered prevention intervention for military children and families facing wartime deployments. *American Journal of Public Health*, *102*(S1), S48-S54.

Levant, R.F., Stefanov, D.G., Rankin, T.J., Halter, M.J., Mellinger, C., & Williams, C. M. (2013). Moderated path analysis of the relationships between masculinity and men's attitudes toward seeking psychological help. *Journal of Counseling Psychology*, *60*(3), 392-406.

Levav, I., Greenfield, H., & Baruch, E. (1979). Psychiatric combat reactions during the Yom Kippur war. *American Journal of Psychiatry*, 136, 637-641.

Levenson, R.L., Jr. & Dwyer, L.A. (2003). Peer support in law enforcement: Past, present, and future. *International Journal of Emergency Mental Health*, 5, 147-152.

Lewandowski, J., Rosenberg, B.D., Jordan Parks, M., & Siegel, J.T. (2011). The effect of informal social support: Face-to-face versus computer-mediated communication. *Computers in Human Behavior*, 27(5), 1806-1814

Lexis, M.A., Jansen, N.W., Huibers, M.J., van Amelsvoort, L.G., Berkouwer, A., Ton, G. T.A., & Kant, I. (2011). Prevention of long-term sickness absence and major depression in high-risk employees: a randomised controlled trial. *Occupational and Environmental Medicine*, 68(6), 400-407.

Lunasco, T.K., Goodwin, E.A., Ozanian, A.J., & Loflin, E.M. (2010). One Shot-One Kill: a culturally sensitive program for the warrior culture. *Military Medicine*, 175(7), 509-513.

Luty, J., Umoh, O., Sessay, M., & Sarkhel, A. (2007). Effectiveness of Changing Minds campaign factsheets in reducing stigmatised attitudes towards mental illness. *Psychiatric Bulletin*, *31*(10), 377-381.

Macik-Frey, M., Quick, J.C., & Cooper, C.L. (2009). Authentic leadership as a pathway to positive health. *Journal of Organizational Behavior*, *30*(3), 453-458.

MacManus, D., Dean, K., Jones, M., Rona, R.J., Greenberg, N., Hull. L., & Fear, N.T. (2013). Violent offending by UK military personnel deployed to Iraq and Afghanistan: a data linkage cohort study. *Lancet*, 381(9870), 907-917.

MacManus, D., Dean, K., Al Bakir, M., Iversen, A. C., Hull, L., Fahy, T., ... & Fear, N. T. (2012). Violent behaviour in UK military personnel returning home after deployment. *Psychological Medicine*, *42*(08), 1663-1673.

McAllister, P.D. (2006). Military Psychiatry. *Journal of the Royal Army Medical Corps*, *152*(2), 104-107.

McAllister, P.D., Blair, S.P.R., & Philpott, S. (2004). Op Telic--A Field Mental Health Team In The General Support Medical Setting. *Journal of the Royal Army Medical Corps*, 50(2), 107-112.

McHorney, C.A., Ware, J.E. Jr., Raczek, A.E. (1993). The MOS 36-Item Short-Form Health Survey (SF-36): II. Psychometric and clinical tests of validity in measuring physical and mental health constructs. *Medical Care*; 31: 247–263

McLay, R.N., Deal, W.E., Murphy, J.A., Center, K.B., Kolkow, T.T., Grieger, T.A. (2008). On-the-Record Screenings Versus Anonymous Surveys in Reporting PTSD. *American Journal of Psychiatry*, 165(6), 775-6.

Meichenbaum, D., & Cameron, R. (1989). Stress inoculation training. Springer US.

Meichenbaum, D. (2007). Stress inoculation training: A preventative and treatment approach. *Principles and Practice of Stress Management*, *3*, 497-518.

Ministry of Defence, Annual Report and Accounts 2011–12 (London: TSO, 2011), p7.

Ministry of Defence. (2004). Service Personnel Executive Group (SPEG) 19/04 Phase 1. Overarching review of operational stress management, dated 29 September 2004.

Ministry of Defence. (2005). Service Personnel Executive Group (SPEG). Overarching review of operational stress management. Phase 2, Training and communications strategy dated 14 April 2005.

Ministry of Defence. Joint Service Publication 346. PULHHEEMS—A Joint System of Medical Classification. 2006.

Mojtabai, R., Olfson, M., Sampson, N. A., Jin, R., Druss, B., Wang, P. S., & Kessler, R. C. (2011). Barriers to mental health treatment: results from the National Comorbidity Survey Replication. *Psychological Medicine*, *41*(8), 1751-61.

Momen, N., Strychacz, C.P., & Viirre E. (2012). Perceived stigma and barriers to mental health care in Marines attending the Combat Operational Stress Control program. *Military Medicine*, 177(10), 1143-1148.

Moran, Charles McMoran Wilson Baron. The anatomy of courage. Boston: Houghton Mifflin, 1967.

Mukuria, C., Brazier, J., Barkham, M., Connell, J., Hardy, G., Hutten, R., & Parry, G. (2013). Cost-effectiveness of an Improving Access to Psychological Therapies service. *The British Journal of Psychiatry*, 202(3), 220-227.

Mulligan, K., Fear, N.T., Jones, N., Alvarez, H., Hull, L., Naumann, U., Wessely, S. & Greenberg, N. (2012). Postdeployment battlemind training for the UK. Armed Forces: a cluster randomized controlled trial. *Journal of Consulting and Clinical Psychology*, 80(3), 331-341.

Mulligan, K., Fear, N.T., Jones, N., Wessely, S., and Greenberg, N. (2010). Psycho-educational interventions designed to prevent deployment-related psychological ill-health in Armed Forces personnel: a review. *Psychological Medicine*, 41, 673-678.

Mulligan, K., Jones, N., Davies, M., McAllister, P., Fear, N.T., Wessely S, Greenberg, N. (2012) Figurehting on two fronts – the effects of home on the mental health of British Forces serving in Iraq and Afghanistan. *British Journal of Psychiatry*; 201(3): 193-198.

Mulligan, K., Jones, N., Woodhead, C., Davies, M., Wessely, S., & Greenberg, N. (2010). Mental health of UK military personnel while on deployment in Iraq. *The British Journal of Psychiatry*, 197, 405–410.

Murphy, L.R., Sauter, S.L. (2003). The U.S.A perspective: Current issues and trends in the management of work stress. *Australian Psychologist*, 38, 151–57.

National Institute for Health and Clinical Excellence. Management of long-term sickness absence and incapacity for work (public health guidance 19). (2009). www.nice.org.uk/PH19.

Nawijn J. (2010). The holiday happiness curve: a preliminary investigation into mood during a holiday abroad. *International Journal of Tourism Research*, 12(3):281-290.

Nelson, N. W., Anderson, C. R., Thuras, P., Kehle-Forbes, S. M., Arbisi, P. A., Erbes, C. R., & Polusny, M. A. (2015). Factors associated with inconsistency in self-reported mild traumatic brain injury over time among military personnel in Iraq. *The British Journal of Psychiatry*, doi: 10.1192/bjp.bp.114.149096

Nielsen, M.L., Rugulies, R., Christensen, K.B., Smith-Hansen, L., & Kristensen, T.S. (2006). Psychosocial work environment predictors of short and long spells of registered sickness absence during a 2-year follow up. *Journal of Occupational and Environmental Medicine*, *48*(6), 591-598.

NICE public health guidance PH22: Promoting mental wellbeing at work. (2009). www.nice.org.uk/PH22.

Nugent, N.R., Brown, R., Stratton, K., & Amstadter, A.B. (2013). Epidemiology of post-traumatic stress disorder. In - *A Life Course Approach to Mental Disorders*. Oxford Scholarship Online. DOI: http://dx.doi.org/10.1093/acprof:oso/9780199657018.003.0010

Nordqvist, C., Johansson, K., & Bendtsen, P. (2004). Routine screening for risky alcohol consumption at an emergency department using the AUDIT-C questionnaire. *Drug and Alcohol Dependence*, 74(1), 71-75.

Noy S., Levy, R., & Solomon, Z. (1984). Mental health care in the Lebanon War, 1982. Israel Journal of Medical Sciences, 20(4), 360-363.

Oliver, M.I., Pearson, N., Coe, N., & Gunnell, D. (2005). Help-seeking behaviour in men and women with common mental health problems: cross-sectional study. *The British Journal of Psychiatry,* 186(4):297-301.

Oleski, J., Mota, N., Cox, B., & Sareen, J. (2010). Perceived need for care, help seeking, and perceived barriers to care for alcohol use disorders in a national sample. *Psychiatric Services*, *61*(12), 1223-1231.

Ong, A.D., & Wiss, D.J. (2000). The Impact of Anonymity on Responses to Sensitive Questions. *Journal of Applied Social Psychology*, 30(8), 1691-1708.

Orme, G.J., & Kehoe, E.J. (2014). Hardiness as a Predictor of Mental Health and Well-Being of Australian Army Reservists on and After Stability Operations. *Military Medicine*, 179(4), 404-412.

Osório, C., Jones, N., Fertout, M., & Greenberg, N. (2012). Perceptions of stigma and barriers to care among UK military personnel deployed to Afghanistan and Iraq. *Anxiety, Stress & Coping*, DOI:10.1080/10615806.2012.725470.

Osório, C., Jones, N., Fertout, M., & Greenberg, N. (2013). Changes in stigma and barriers to care over time in UK Forces deployed to Afghanistan between 2008 and 2011. *Military Medicine,* 178(8), 846-853.

Ouimette P, Vogt D, Wade M, Tirone V, Greenbaum, M.A., Kimerling R, et al. Perceived barriers to care among veterans health administration patients with posttraumatic stress disorder. *Psychological Services*. 2011;8(3):212-223

Paljarvi T., Koskenvuo M., Poikolainen K., Kauhanen J., Sillanmaki L., & Makela P. (2009) Binge drinking and depressive symptoms: a 5-year population-based cohort study. *Addiction*, 104: 1168–78.

Pargament, K.I., & Sweeney, P.J.. (2011). Building spiritual fitness in the Army: An innovative approach to a vital aspect of human development. *American Psychologist*, 66, 58-64

Parkes, K.R. (2010). Offshore working time in relation to performance, health and safety - A review of current practice and evidence.

Parsloe, L., Jones, N., Fertout., M., & Greenberg, N. (2014). Rest and Recuperation in the United Kingdom Armed Forces. *Occupational Medicine:* doi:10.1093/occmed/kqu119

Paykel, E.S., Hart, D. & Priest, R.G. (1998) Changes in public attitudes to depression during the Defeat Depression Campaign. *British Journal of Psychiatry*, 173, 519– 522.

Pepin, R., Segal, D.L., Coolidge, F.L. (2009). Intrinsic and extrinsic barriers to mental health care among community-dwelling younger and older adults. *Aging & Mental Health,* 13(5):769-77.

Pescosolido, B.A., Martin, J.K., Long, J.S., Medina, T.R., Phelan, J.C., & Link, B.G. (2010). "A disease like any other"? A decade of change in public reactions to schizophrenia, depression, and alcohol dependence. *American Journal of Psychiatry*, *167*(11), 1321-1330.

Peterson, C., Park, N., & Castro, C.A. (2011). Assessment for the U.S. Army Comprehensive Soldier Fitness program: The Global Assessment Tool. American *Psychologist*, 66, 10-18.

Pietrzak, R., Johnson, D., Goldstein, M., Malley, J., Southwick, S. (2009) Perceived stigma and barriers to mental health care utilization among OEF-OIF veterans. *Psychiatric Services*, 60(8):1118-22.

Pincus, S.H., House, R., Christenson, J., & Adler, L.E. (2001). The emotional cycle of deployment: A military family perspective. *US Army Medical Department Journal*, *4*(5), 1-6.

Pincus, S.H., & Benedek, D.M. (1998). Operational stress control in the former Yugoslavia: a joint endeavor. *Military Medicine*, 163(6), 358-362.

Pinder, R.J., Fear, N.T., Wessely, S., Reid, G.E., & Greenberg, N. (2010). Mental health care provision in the UK Armed Forces. Military Medicine, 175(10), 805-810.

Pomaki, G., Franche, R.L., Murray, E., Khushrushahi, N., & Lampinen, T.M. (2012) Workplace-based work disability prevention interventions for workers with common mental health conditions: a review of the literature. *Journal of Occupational Rehabilitation*, 22:182–195.

Prins, A., Ouimette, P., Kimerling, R., Cameron, R., Hugleshofer, D., Shaw-Hegwar, J., Thrailkill, A., Gusman, F.D., Sheikh, J.I. (2004). The Primary Care PTSD Screen (PC-PTSD): Development and operating characteristics. *Primary Care Psychiatry*, 9, 9-14.

PULHHEEMS Administrative Pamphlet November 2007 D/DM(A)/82/32/D/STOS AC13371.

Quartana, P.J., Wilk, J.E., Thomas, J.L., Bray, R.M., Rae Olmsted, K.L., Brown, J.M., & Hoge, C.W. (2014). Trends in mental health services utilization and stigma in US soldiers from 2002 to 2011. *American Journal of Public Health*, *104*(9), 1671-1679.

RAF Health Report 2012/13. HM Stationary Office.

Rai, D., Kosidou, K., Lundberg, M., Araya, R., Lewis, G., & Magnusson, C. (2012). Psychological distress and risk of long-term disability: population-based longitudinal study. *Journal of Epidemiology and Community Health*, 66(7), 586-592.

Rao, J.N.K., & Scott A.J. (1984). On chi-Squared Tests for Multiway Contingency Tables with Cell Proportions Estimated from Survey Data. *Annals of Statistics*, 12:1: 46-60.

Reavley, N.J., Cvetkovski, S., Jorm, A.F., & Lubman, D.I. (2010). Help-seeking for substance use, anxiety and affective disorders among young people: results from the 2007 Australian National Survey of Mental Health and Wellbeing. *Australian and New Zealand Journal of Psychiatry*, *44*(8), 729-735.

Richards, D. (1999). Symptom severity, personal and social variables after armed robbery. *British Journal of Clinical Psychology*, 39(4), 415-419.

Riddle, M.S., Sanders, J.W., Jones, J.J., & Webb, S.C. (2008). Self-reported combat stress indicators among troops deployed to Iraq and Afghanistan: an epidemiological study. *Comprehensive Psychiatry*, *49*(4):340-345.

Riddle, J.R., Smith, T.C., Smith, B., Corbeil, T.E., Engel, C.C., Wells, T.S., & Blazer, D. (2007). Millennium Cohort: the 2001–2003 baseline prevalence of mental disorders in the US military. *Journal of Clinical Epidemiology*, 60(2), 192-201.

Rona, R.J., Fear, N.T., Hull, L., Greenberg, N., Earnshaw, M., Hotopf, M., & Wessely, S. (2007). Mental health consequences of overstretch in the UK Armed Forces: first phase of a cohort study. *British Medical Journal*, *335*(7620), 603.

Rona, R.J., Jones, M., Fear, N.T., Hull, L., Hotopf, M., & Wessely, S. (2010). Alcohol misuse and functional impairment in the UK Armed Forces: a population-based study. *Drug and Alcohol Dependence*, *108*(1):37-42.

Rona, R.J., Jones, M., Iversen, A., Hull, L., Greenberg, N., Fear, N.T., & Wessely, S. (2009). The impact of posttraumatic stress disorder on impairment in the UK military at the time of the Iraq war. *Journal of Psychiatric Research*, *43*(6):649-655.

Rona, R., Hyams, C., & Wessely, S. (2005). Screening for Psychological Illness in Military Personnel. *JAMA*, 293, 1257-60.

Rona, R., Jones, M., Hooper, R., Hull, L., Browne, T., Horn, O., Murphy, D., Hotopf, M., & Wessely, S. (2006). Mental health screening in Armed Forces before the Iraq war and prevention of subsequent psychological morbidity: follow-up study. *British Medical Journal*, 333, 991-995.

Rona, R.J., Hooper, R., Jones, M., Iversen, A.C., Hull, L., Murphy, D., & Wessely, S. (2009). The contribution of prior psychological symptoms and combat exposure to post Iraq deployment mental health in the UK military. *Journal of Traumatic Stress*, 22(1), 11-19.

Rona, R.J., Hooper, R., Greenberg, N., Jones, M., and Wessely, S. (2006). Medical downgrading, self-perception of health, and psychological symptoms in the British Armed Forces. *Occupational and Environmental Medicine*, 63:250–254.

Rose, R.D., Buckey Jr, J.C., Zbozinek, T.D., Motivala, S.J., Glenn, D.E., Cartreine, J.A., & Craske, M.G. (2012). A Randomized Controlled Trial of a Self-Guided, Multimedia, Stress Management and Resilience Training Program. *Behaviour Research and Therapy*, 51(2), 106-112.

Rosenbaum, P.R., & Rubin, D.B. (1983). The Central Role of the Propensity Score in Observational Studies for Causal Effects. *Biometrika*, 70:1: 41-55.

Rosenbaum, P.R. Observational Studies. (2002); New York, NY: Springer.

Rundell, J.R. (2006). Demographics of and diagnoses in Operation Enduring Freedom and Operation Iraqi Freedom personnel who were psychiatrically evacuated from the theater of operations. *General Hospital Psychiatry*, *28*(4), 352-356.

Rüsch, N., & Thornicroft, G. (2014). Does stigma impair prevention of mental disorders? *British Journal of Psychiatry*, 204:249-51. doi: 10.1192/bjp.bp.113.131961.

Ryff, C.D., & Singer, B. (1996). Psychological well-being: Meaning, measurement, and implications for psychotherapy research. *Psychotherapy and Psychosomatics*, 65(1), 14-23.

Sainsbury Centre for Mental Health. (2007). Mental health at work: Developing the business case. http://www.centreformentalhealth.org.uk/pdfs/mh_at_work_summary.pdf

Saitz, R. (2014). The best evidence for alcohol screening and brief intervention in primary care supports efficacy, at best, not effectiveness: You say tomāto, I say tomăto? That's not all it's about. *Addiction Science & Clinical Practice*, *9*(1), 14.

Sajatovic, M., Sanders, R., Alexeenko, L., & Madhusoodanan, S. (2010). Primary prevention of psychiatric illness in special populations. *Annals of Clinical Psychiatry*, 22(4), 262-273.

Saltychev, M., Laimi, K., El-Metwally, A., Oksanen, T., Pentti, J., Virtanen, M., & Vahtera, J. (2012). Effectiveness of multidisciplinary primary prevention in decreasing the risk of work disability in a low-risk population. *Scandinavian Journal of Work, Environment & Health*, 38(1).

SAMH (Scottish Association for Mental Health) (2011) What's it Worth Now? Glasgow. http://www.centreformentalhealth.org.uk/pdfs/what's_it_worth_now_report.pdf

Sanyal, C., Asbridge, M., Kisely, S., Sketris, I., & Andreaou, P. (2011). Prevalance and determinants of antidepressant use among Canadian Forces members experiencing major depressive episodes. *Journal of Population Therapeutics & Clinical Pharmacology*, 18(1), e54-64.

Sareen, J., Cox, B.J., Afifi, T.O., Stein, M.B., Belik, S. L., Meadows, G., & Asmundson, G.J. (2007). Combat and peacekeeping operations in relation to prevalence of mental disorders and perceived need for mental health care: findings from a large representative sample of military personnel. *Archives of General Psychiatry*, 64(7), 843-852.

Schlenger, W.E., Kulka, R.A., Fairbank, J.A., Hough, R.L., Kathleen Jordan, B., Marmar, C.R., & Weiss, D.S. (1992). The prevalence of post-traumatic stress disorder in the Vietnam generation: a multimethod, multisource assessment of psychiatric disorder. *Journal of Trauma Stress*, 5:333-363

Schmitz, K.J., Schmied, E.A., Webb-Murphy, J.A., Hammer, P.S., Larson, G.E., Conway, T.L., & Johnson, D.C. (2012). Psychiatric diagnoses and treatment of US military personnel while deployed to Iraq. *Military Medicine*, *177*(4), 380-389.

Schofield, D.J., Callander, E.J., Shrestha, R.N., Percival, R., Kelly, S.J., & Passey, M.E. (2013a). The association between labour force participation and being in income poverty amongst those with mental health problems. *Aging & Mental Health*, 17(2), 250-257.

Schofield, D.J., Callander, E.J., Shrestha, R.N., Percival, R., Kelly, S.J., & Passey, M.E. (2013b). Premature retirement due to ill health and income poverty: a cross-sectional study of older workers. *British Medical Journal open*, 3(5).

Schofield, D.J., Shrestha, R.N., Percival, R., Passey, M.E., Callander, E.J., & Kelly, S.J. (2011). The personal and national costs of mental health conditions: impacts on income, taxes, government support payments due to lost labour force participation. *BMC Psychiatry*, 11(1), 72.

Scholes C., Turpin, G., & Mason, S. (2007). A randomised controlled trial to assess the effectiveness of providing self-help information to people with symptoms of acute stress disorder following a traumatic injury. *Behaviour Research and Therapy*, 45, 2527–2536

Schomerus, G., Lucht, M., Holzinger, A., Matschinger, H., Carta, M. G., & Angermeyer, M.C. (2011). The stigma of alcohol dependence compared with other mental disorders: a review of population studies. *Alcohol and Alcoholism*, *46*(2), 105-112.

Schomerus, G., Matschinger, H., & Angermeyer, M.C. (2009). The stigma of psychiatric treatment and help-seeking intentions for depression. *European Archives of Psychiatry and Clinical Neuroscience*, *259*(5), 298-306.

Scott, J.N. (2005). Diagnosis and outcome of psychiatric referrals to the Field Mental Health Team, 202 Field Hospital, Op Telic 1. *Journal of the Royal Army Medical Corps*, 151, 95-100.

Seal, K.H., Bertenthal, D., Maguen, S., Gima, K., Chu, A., & Marmar, C.R. (2008). Getting beyond "Don't ask; don't tell": an evaluation of US Veterans Administration postdeployment mental health screening of veterans returning from Iraq and Afghanistan. *American Journal of Public Health*, 98(4), 714-720.

Seal, K.H., Maguen, S., Cohen, B., Gima, K. S., Metzler, T. J., Ren, L. & Marmar, C. R. (2010). VA mental health services utilization in Iraq and Afghanistan veterans in the first year of receiving new mental health diagnoses. *Journal of Traumatic Stress*, 23(1), 5-16.

Seal, K.H., Metzler, T.J., Gima, K.S., Bertenthal, D., Maguen, S., & Marmar, C.R. (2009). Trends and risk factors for mental health diagnoses among Iraq and Afghanistan veterans using Department of Veterans Affairs health care, 2002–2008. *American Journal of Public Health*, *99*(9): 1651-1658.

Seelig, A.D., Jacobson, I.G., Smith, B., Hooper, T.I., Gackstetter, G.D., Ryan, M.A., & Smith, T.C. (2012). Prospective evaluation of mental health and deployment experience among women in the US military. *American Journal of Epidemiology*, 176, 135-45.

Sharac, J., Mccrone, P., Clement, S., & Thornicroft, G. (2010). The economic impact of mental health stigma and discrimination: a systematic review. Epidemiologia e Psichiatria Sociale, 19(03), 223-232.

Sharpley, J.G., Fear, N.T., Greenberg, N., Jones, M., & Wessely, S. (2008). Pre-deployment stress briefing: does it have an effect? *Occupational Medicine*, 58(1), 30-34.

Shigemura, J., Nomura, S. (2002). Mental health issues of peacekeeping workers. *Psychiatry and Clinical Neurosciences*, 56, 483–491.

Shlosberg, A., & Strous, R.D. (2005). Long-term follow-up (32 Years) of PTSD in Israeli Yom Kippur War veterans. *The Journal of Nervous and Mental Disease*, 193(10), 693-696.

Sijbrandij, M., Olff, M., Reitsma, J.B., Carlier, I.V., & Gersons, B.P. (2006). Emotional or educational debriefing after psychological trauma Randomised controlled trial. *The British Journal of Psychiatry*, *189*(2), 150-155.

Skomorovsky, A., & Lee, J.E.C. (2012). Alcohol use among Canadian Forces candidates: The role of psychological health and personality. Military Psychology, 24, 513-528.

Sipos, M.L., Foran, H.M., Crane, M.L., Wood, M.D. & Wright, K.M. (2012). Postdeployment behavioural health screening: face-to-face versus virtual behavioural health interviews. *Military Medicine*, 177(5): 525-530.

Sirey, J.A., Bruce, M.L., Alexopoulos, G.S., Perlick, D.A., Raue, P., Friedman, S.J., & Meyers, B.S. (2001). Perceived stigma as a predictor of treatment discontinuation in young and older outpatients with depression. *American Journal of Psychiatry*, *158*(3), 479-481.

Slomski, A. (2014). IOM: Military psychological interventions lack evidence. *JAMA*, 311, 1487-1488.

Smith, T.C., Ryan, M.A., Wingard, D.L., Slymen, D.J., Sallis, J.F., & Kritz-Silverstein, D. (2008). New onset and persistent symptoms of post-traumatic stress disorder self reported after deployment and combat exposures: prospective population based US military cohort study. *British Medical Journal*, *336*(7640), 366-371.

Solomon, Z., & Benbenishty, R., (1986). The role of proximity, immediacy, and expectancy in frontline treatment of combat stress reaction among Israelis in the Lebanon war. *American Journal of Psychiatry*, 143, 613–617.

Solomon, Z., & Mikulincer, M. (2003). Trajectories of PTSD: A 20-year longitudinal study. *American Journal of Psychiatry*, 163, 659–666.

Solomon, Z., Shklar, R., & Mikulincer, M. (2005). Frontline treatment of combat stress reaction: a 20-year longitudinal evaluation study. *American Journal of Psychiatry*, *162*(12),

2309-2314.

Sonnentag, S., & Fritz, C. (2007). The recovery experiences questionnaire: Development and validation of a measure for assessing recuperation and unwinding from work. *Journal of Occupational Health Psychology*, 12(3):204-221.

Spira, J.L., Johnston, S., McLay, R., Popovic, S., Russoniello, C. & Wood, D. (2010). Expert panel: future directions of technological advances in prevention, assessment, and treatment for military deployment mental health. *Cyberpsychology, Behavior and Social Networking*, 13(1), 109-117.

Stansfeld, S. A., Fuhrer, R., & Head, J. (2011). Impact of common mental disorders on sickness absence in an occupational cohort study. *Occupational and Environmental Medicine*, 68(6), 408-413.

Stecker, T., Fortney, J., Hamilton, F., & Ajzen, I. (2007). An assessment of beliefs about mental health care among veterans who served in Iraq. *Psychiatric Services*, *58*(10), 1358-1361.

Steenkamp, M.M., Nash, W.P., & Litz, B.T. (2013). Post-Traumatic stress disorder: review of the Comprehensive Soldier Fitness program. *American Journal of Preventive Medicine*, 44(5), 507-512.

Stetz, M.C., McDonald, J.J., Lukey, B.J., & Gifford, R.K. (2005). Psychiatric diagnoses as a cause of medical evacuation. *Aviation, Space, and Environmental Medicine*, *76* (Supplement 1), C15-C20.

Strauss-Blasche, G., Ekmekcioglu, C., & Marktl, W. (2000). Does vacation enable recuperation? Changes in well-being associated with time away from work. *Occupational Medicine*, 50(3):167-172.

Sundin, J., Fear, N.T., Iversen, A., Rona, R.J., & Wessely, S. (2010). PTSD after deployment to Iraq: conflicting rates, conflicting claims. *Psychological Medicine*, 40(3), 367-382.

Sundin, J., Herrell, R.K., Hoge, C.W., Fear, N.T., Adler, A.B., Greenberg, N., & Bliese, P.D. (2014). Mental health outcomes in US and UK military personnel returning from Iraq. *The British Journal of Psychiatry*, 204(3):200-207.

Sundin, J., Jones, N., Greenberg, N., Rona, R. J., Hotopf, M., Wessely, S. and Fear, N. T. (2010). Mental health among commando, airborne and other UK infantry personnel. *Occupational Medicine*; 60:552–559.

Talebi, M., Matheson, K., & Anisman, H. (2013). Support, depressive symptoms, and the stigma towards seeking mental health help. *International Journal of Social Science Studies*, 1(1), 133-144.

Taris, T.W., Ybema, J.F., Beckers, D.G., Verheijden, M.W., Geurts, S.A., & Kompier, M.A. (2011). Investigating the associations among overtime work, health behaviors, and health: a longitudinal study among full-time employees. *International Journal of Behavioral Medicine*, 18(4), 352-360.

Taylor, A., & Schatz, S. (2011). Measuring the effectiveness of stress prevention programs in military personnel. Foundations of Augmented Cognition. *Directing the Future of Adaptive Systems*, 6780: 636-646.

Taylor, M.K., Stanfill, K.E., Padilla, G.A., Markham, A.E., Ward, M.D., Koehler, M.M., & Adams, B.D. (2011). Effect of Psychological Skills Training During Military Survival School: A Randomized, Controlled Field Study. Military Medicine, 176(12), 1362-1368.

Tehrani, N. (2002). Workplace trauma and the law. *Journal of Traumatic Stress*, 15(6), 473-477.

Thrailkill, A., Gusman, F.D., Sheikh, J.I. (2004). The Primary Care PTSD Screen (PC-PTSD): Development and operating characteristics. *Primary Care Psychiatry*, 9, 9-14.

Turner, M.A., Kiernan, M.D., McKechanie, A.G., Finch, P.J., McManus, F.B., & Neal, L.A. (2005). Acute military psychiatric casualties from the war in Iraq. *The British Journal of Psychiatry*, *186*(6), 476-479.

Turpin, G., Downs., M. & Mason, S. (2005). Effectiveness of providing self-help information following acute traumatic injury: randomized controlled trial. *British Journal of Psychiatry*, 187, 76-82.

United States Department of Defence Directive 1327.5. (2004). DoD Policy on Leave and Liberty.

Unwin, C., Blatchley, N., Coker, W., Ferry, S., Hotopf, M., Hull, L., & Wessely, S. (1999). Health of UK servicemen who served in the Persian Gulf War. *Lancet, 1999*: 353, 169–78.

van den Berg, T.I., Elders, L.A., & Burdorf, A. (2010). Influence of health and work on early retirement. *Journal of Occupational and Environmental Medicine*, 52(6), 576-583.

van der Klink, J.J., Blonk, R.W., Schene, A.H., & van Dijk, F.J. (2003). Reducing long term sickness absence by an activating intervention in adjustment disorders: a cluster randomised controlled design. *Occupational and Environmental Medicine*, 60(6), 429-437.

van Oostrom, S.H., van Mechelen, W., Terluin, B., de Vet, H.C., Knol, D.L., & Anema, J.R. (2010). A workplace intervention for sick-listed employees with distress: results of a randomised controlled trial. *Occupational and Environmental Medicine*, 67(9), 596-602.

Van Voorhees B.W., Gollan J. & Fogel J. (2012). Pilot study of internet-based early intervention for combat-related mental distress. Journal of Rehabilitation Research and Development, 49, 1175-1190.

Vermetten, E., Greenberg, N., Boeschoten, M.A., Delahaije, R., Jetly, R., Castro, C.A., & McFarlane, A. C. (2014). Deployment-related mental health support: comparative analysis of NATO and allied ISAF partners. *European Journal of Psychotraumatology*, 5.

Vicary, J.R. (1994). Primary prevention and the workplace. *The Journal of Primary Prevention*, 15(2), 99-103.

Vogel, D.L., Wade, N.G., & Haake, S. (2006). Measuring the self-stigma associated with seeking psychological help. *Journal of Counseling Psychology*, *53*(3), 325-337.

Vogt, D. (2011). Mental health-related beliefs as a barrier to service use for military personnel and veterans: a review. *Psychiatric Services*, 62, 135–42

Waddell, G., & Burton, A. Is work good for your health and well-being? (2006). London: (The Stationery Office).

Walumbwa, F.O., Avolio, B.J., Gardner, W.L., Wernsing, T.S., & Peterson, S.J. (2008). Authentic Leadership: Development and Validation of a Theory-Based Measure. *Journal of Management*, *34*(1), 89-126.

Wang, P.S., Aguilar-Gaxiola, S., Alonso, J., Angermeyer, M.C., Borges, G., Bromet, E.J. & Wells, J.E. (2007). Use of mental health services for anxiety, mood, and substance disorders in 17 countries in the WHO world mental health surveys. *Lancet*, *370*(9590), 841-850.

Wang, P.S., Lane, M., Olfson, M., Pincus, H.A., Wells, K.B., & Kessler, R.C. (2005). Twelve-month use of mental health services in the United States: results from the National Comorbidity Survey replication. *Archives of General Psychiatry*, *62*(6), 629-640.

Ware, J.E. Jr., & Sherbourne, C.D. (1992). The MOS 36-item short-form health survey (SF-36). Conceptual framework and item selection. *Medical Care*, 30:473–83.

Warner, C.H., Appenzeller, G.N., Grieger, T., Belenkey, S., Breitbach, J., Parker, J., & Hoge, C. (2011). Importance of anonymity to encourage honest reporting in mental health screening after combat deployment. *Archives of General Psychiatry*, 68(10), 1065.

Watson, P. J., & Shalev, A. Y. (2005). Assessment and treatment of adult acute responses to traumatic stress following mass traumatic events. *CNS spectrums*, *10*(02), 123-131.

Weathers F, Litz B, Herman D, Huska J & Keane T. (1994). The PTSD Checklist – Civilian Version (PCL–C). *Boston: National Center for PTSD*.

Wessely, S., Bryant, R.A., Greenberg, N., Earnshaw, M., Sharpley, J., & Hughes, J.H. (2008). Does psycho-education help prevent post traumatic psychological distress? *Psychiatry: Interpersonal and Biological Processes*, *71*(4), 287-302.

Wesson, M., Whybrow, D., Gould, M., & Greenberg, N. (2014). An Initial Evaluation of the Clinical and Fitness for Work Outcomes of a Military Group Behavioural Activation Programme. *Behavioural and Cognitive Psychotherapy*, 42(02), 243-247.

Whitesell, A.A., & Owens, G.P. (2012). The Impact of Patriotism, Morale, and Unit Cohesion on Mental Health in Veterans of Iraq and Afghanistan. *Traumatology*, 18(1), 1-7.

Whybrow, D., Jones, N., & Greenberg, N. (2013). Corporate knowledge of psychiatric services available in a combat zone. *Military Medicine*, *178*(2), e241-e247.

Williams, C., Wilson, P., Morrison, J., McMahon, A., Andrew, W., Allan, L., & Tansey, L. (2013). Guided Self-Help Cognitive Behavioural Therapy for Depression in Primary Care: A Randomised Controlled Trial. *PLOS ONE*., (1), e52735.

Wilson, J., Jones, M., Fear, N.T., Hull L, Hotopf, M., Wessely, S., Rona, R.J. (2009). Is previous psychological health associated with the likelihood of Iraq War deployment? An investigation of the "Healthy Warrior Effect". *American Journal of Epidemiology*, 169 (11), 1362-1369.

Woodhead, C., Rona, R.J., Iversen, A., MacManus, D., Hotopf, M., Dean, K., McManus, S., Meltzer, H., Brugha, T., Jenkins, R., Wessely, S., & Fear, N.T. (2011). Mental health and health service use among post-national service veterans: results from the 2007 Adult Psychiatric Morbidity Survey of England. *Psychological Medicine*, 41, 363-372.

Woodhead, C., Wessely, S., Jones, N., Fear, N.T., Hatch, S.L. (2012). Impact of exposure to combat during deployment to Iraq and Afghanistan on mental health by gender. *Psychological Medicine,* 42(09), 1985-1996.

World Health Organization. (1992). The ICD-10 classification of mental and behavioural disorders: clinical descriptions and diagnostic guidelines. Vol. 1. World Health Organization.

Promoting mental health: concepts, emerging evidence and practice. (2005). http://www.who.int/mental_health/evidence/en/promoting_mhh.pdf (accessed Jan, 2013).

Wright, K.M., Cabrera, O.A., Bliese, P.D., Adler, A.B., Hoge, C.W., Castro, C.A. (2009). Stigma and barriers to care in soldiers postcombat. *Psychological Services*, 6: 108–116.

www.dasa.mod.uk TSP 8 Age Structure. Accessed 19 April 2013.

www.dasa.mod.uk TSP 9, Rank Structure, TSP 8 Age Structure, TSP 3 Armed Forces Personnel Report. Accessed 17 April 2013.

www.bigwhitewall.com retrieved April 2013.

Ye, J., Shim, R., & Rust, G. (2012). Health Care Avoidance among People with Serious Psychological Distress: Analyses of 2007 Health Information National Trends Survey. *Journal of Health Care for the Poor and Underserved*, *23*(4), 1620-1629.

Zamorski, M.A., Guest, K., Bailey, S. and Garber, B.G. (2012). Beyond Battlemind: Evaluation of a New Mental Health Training Program for Canadian Forces Personnel Participating in Third-Location Decompression. *Military Medicine*, 177(11), 1245-1253.

Zamorski, M. (2011). Towards a broader conceptualization of need, stigma, and barriers to mental health care in military organisation: recent research findings from the Canadian Forces. Ottawa: NATO.

Zamorski, M.A., Rusu, C. & Garber, B.G. (2014). Prevalence and correlates of mental health problems in Canadian Forces personnel who deployed in support of the mission in Afghanistan: findings from postdeployment screenings, 2009-2012. *Canadian Journal of Psychiatry - Revue Canadienne de Psychiatrie*, 59(6), 319-26.

Zeiss, A.M., & Karlin, B.E. (2008). Integrating mental health and primary care services in the Department of Veterans Affairs health care system. *Journal of Clinical Psychology in Medical Settings*, *15*(1), 73-78.

Zijlstra, F.R.H., & Sonnentag, S. (2006). After work is done: Psychological perspectives on recovery from work. *European Journal of Work and Organizational Psychology*, 15(2):129-138.

Zinzow, H.M., Britt, T.W., McFadden, A.C., Burnette, C.M., & Gillispie, S. (2012). Connecting active duty and returning veterans to mental health treatment: Interventions and treatment adaptations that may reduce barriers to care. *Clinical Psychology Review*, 32(8), 741–75.

Appendices:

Appendix 1. R&R Experiences Scale

As you have recently had R&R and we would like to hear about your experiences. Below is a list of statements. Please rate how much you agree with the statements:

	Strongly Agree	Agree	Disagree	Strongly Disagree
I could relax and switch off from feeling in danger	☐	☐	☐	☐
I got a break from the physical demands of being on tour	☐	☐	☐	☐
I saw family/friends	☐	☐	☐	☐
I did not worry about work or my unit back in Afghanistan	☐	☐	☐	☐
I could chill out	☐	☐	☐	☐
I forgot about work	☐	☐	☐	☐
I did not feel rested by the end of R&R	☐	☐	☐	☐
I got as much support as I wanted from my family/friends	☐	☐	☐	☐
I could switch off and did not think about what was happening in Afghanistan	☐	☐	☐	☐
I felt recharged and had more energy by the end of R&R	☐	☐	☐	☐
I did not think about work at all	☐	☐	☐	☐
I talked about what I have been doing on tour with my family/friends as much as I wanted	☐	☐	☐	☐
It was difficult to kick back and do nothing at home	☐	☐	☐	☐
On R&R I felt close to the people that matter to me	☐	☐	☐	☐
I was able to get a good night's sleep	☐	☐	☐	☐
I could do relaxing things	☐	☐	☐	☐
I did not try to get news about what was happening back in Afghanistan, e.g. by watching the news or using facebook	☐	☐	☐	☐
I have recovered physically	☐	☐	☐	☐
I did not feel close to my family/friends on R&R	☐	☐	☐	☐

R&R EXPERIENCES (Continued)

	Strongly Agree	Agree	Disagree	Strongly Disagree
I found the journey back to the UK frustrating	☐	☐	☐	☐
I lost too many of my R&R days as a result of being delayed on the journey back	☐	☐	☐	☐
The journey back to the UK had a negative impact on my experience of R&R	☐	☐	☐	☐
I did not feel rested by the end of R&R	☐	☐	☐	☐

	Excellent	Good	Poor
How would you rate your experience of the journey back to the UK?	☐	☐	☐

	Very satisfied	Mostly satisfied	Very dissatisfied
Overall, how satisfied are you with your experience of travelling back to the UK?	☐	☐	☐

	Excellent	Good	Fair	Poor
How would you rate the experience of R&R?	☐	☐	☐	☐

	All of my needs were met	Almost all of my needs were met	Only a few of my needs were met	None of my needs were met
How much did R&R meet your needs?	☐	☐	☐	☐

	Yes, I got to do everything I wanted	I got to do most of what I wanted	No, I only got to do a little of what I wanted	No, I didn't get to do anything I wanted
Did you get to do what you wanted to do on R&R?	☐	☐	☐	☐

	Very satisfied	Mostly satisfied	Mildly dissatisfied	Very dissatisfied
Overall, how satisfied are you with the experience of R&R?	☐	☐	☐	☐

	Yes, definitely	Yes, I think so	No, I don't think so	No, definitely not
If you were deployed again, would you like R&R on that deployment?	☐	☐	☐	☐

Appendix 2. The Operational Mental Health Needs Evaluation (OMHNE)

Questionnaire Number

Date of completion: ☐

☐

This questionnaire asks about your deployment experiences and your health and wellbeing. ALL your answers will be treated in the strictest confidence and the results of this survey may help the UK Armed Forces improve the care of deployed personnel. All the answers you provide will be looked at together with those of others and we will NEVER name any individual no matter what answer they provide and no matter how senior the person who wants to know is.

Answering the questions

To answer a question, select the response that you wish to make and fill in the square, like this:

Yes	No	If you make a mistake, correct it by putting a cross through your mistake and selecting another box	Yes	No
☐	■		■	☒

START OF THE QUESTIONNAIRE

PERSONAL DETAILS

Surname …… First name ……..…..

Date of birth …….. Service number ……..

Home telephone no…….

Email address…….

1**Service:** RN ☐ RM ☐ ARMY ☐ RAF ☐

2**Are you:** Regular Forces ☐ Mobilised Reserve Forces ☐

3**Have you deployed with your parent unit?**

Yes	☐
No, but I deployed with some members from my parent unit	☐
No, I didn't know anyone that I deployed with	☐

4**What is your current rank or equivalent?**

Navy		Army/RM		RAF	
AB	☐	Pte/Mne	☐	AC/LAC/JT	☐
LH	☐	LCpl to Cpl	☐	Cpl	☐
PO to WO1	☐	Sgt to WO1	☐	Sgt to WO	☐
Mid to Lt Cdr	☐	2nd Lt to Maj	☐	Plt Offr to Sqn Ldr	☐
Cdr & above	☐	Lt Col & above	☐	Wg Cdr & above	☐

[5]**Your Age:**

18-19 years	☐
20-24 years	☐
25-29 years	☐
30-34 years	☐
35-39 years	☐
40-44 years	☐
45-49 years	☐
50+ years	☐

[6]**Service Length:** How long have you served for?

Less than 1 year	☐
2-4 years	☐
5-12 years	☐
13-22 years	☐
22+ years	☐

[7]**Sex**: Male ☐ Female ☐

[8]**Marital Status, are you?**

Married	☐
Living with a Partner	☐
In a Long Term Relationship	☐
Single & not in a Long Term Relationship	☐
Separated	☐
Divorced	☐
Widowed	☐

[9]**Do you have children?**	Yes	No
Under 18 years	☐	☐
Over 18 years	☐	☐

THEATRE LOCATION AND ACTIVITY

[10]**How many operational tours of more than 30 days duration have you undertaken so far in your military career? (*NOT INCLUDING THE CURRENT TOUR*)**

	0	1	2	3	4	5	6
Iraq Tours	☐	☐	☐	☐	☐	☐	☐
Afghanistan Tours	☐	☐	☐	☐	☐	☐	☐
Other Tours	☐	☐	☐	☐	☐	☐	☐

[11]**During THIS DEPLOYMENT, how many FULL weeks have you been in theatre?**

0-4 weeks	☐	**Please write**
5-8 weeks	☐	**the number of**
9-12 weeks	☐	**full weeks here:**
13-16 weeks	☐	
17-20weeks	☐	
21-24 weeks	☐	
25-28 weeks	☐	
29-32 weeks	☐	
32+ weeks	☐	

[12]**How many FULL months have you spent on operational deployment in the last 3 years?**

Less than 5 months	☐
5-8 months	☐
9-12 months	☐
13-16 months	☐
17-20 months	☐
21-24 months	☐
25-36 months	☐

[13]**During THIS DEPLOYMENT, where are you mostly located?**

Mostly Check Points	☐
Mostly Patrol Bases	☐
Mostly Forward Operating Bases	☐
Mostly Main Bases	☐
Mostly working alone, or with only a few UK personnel, with Afghan military forces	☐

What was your main role in theatre?

[14] **During THIS DEPLOYMENT, how long in total have you spent outside your base in a hostile area? (i.e. patrolling, surge operations, convoys etc.)**

Never	Up to 1 Week	1 Week to 1 Month	More Than a Month
☐	☐	☐	☐

15**What is your MAIN role during THIS DEPLOYMENT?** *(please tick only **ONE** box)*

☐ **Combat Arm** (e.g. Commando, Infantry or Armour and including support arms such as medics, engineers or signals serving with a combat unit)

☐ **Combat Support Arm** (e.g. Artillery, Engineers, Signals, Air, Intelligence, JCBRN)

☐ **Combat Service Support (**e.g. Logistics, REME, Medical Personnel, AGC, MP)

Insert your actual cap badge, Regt, Corps or Service here:

16**During THIS DEPLOYMENT, how often have you believed that you have been in serious danger of being injured or killed?**

Never	Once or Twice	Sometimes	Many Times
☐	☐	☐	☐

[17]Have you experienced any of the following during THIS DEPLOYMENT?	Never	Once	2-4 Times	5-9 Times	10+ Times
Received small arms fire	☐	☐	☐	☐	☐
Encountered enemy sniper fire	☐	☐	☐	☐	☐
Seen dead or seriously injured friendly forces personnel	☐	☐	☐	☐	☐
Received incoming artillery, rocket, or mortar fire	☐	☐	☐	☐	☐
Had a mate injured or killed who was near you	☐	☐	☐	☐	☐
Had an improvised explosive device (IED) or booby trap explode near you	☐	☐	☐	☐	☐
Had a shell, grenade, rocket or missile that failed to explode land near you	☐	☐	☐	☐	☐
Equipment shot or blown off or were shot/hit but protective gear saved you	☐	☐	☐	☐	☐
Shot at the enemy with your personal weapon	☐	☐	☐	☐	☐
Engaged in close quarter battle with fixed bayonet	☐	☐	☐	☐	☐
Been wounded or injured	☐	☐	☐	☐	☐
Cleared/searched homes or buildings, caves or bunkers	☐	☐	☐	☐	☐
Encountered hostile or aggressive reactions from civilians	☐	☐	☐	☐	☐
Been threatened and unable to respond because of the rules of engagement	☐	☐	☐	☐	☐
Provided aid to the wounded	☐	☐	☐	☐	☐
Seen injured or sick women or children who you were unable to help	☐	☐	☐	☐	☐
Handled or discovered human remains	☐	☐	☐	☐	☐

[18]**During THIS DEPLOYMENT have any of the following occurred?**

	Yes	No	NA
Birth of your child	☐	☐	☐
Death or serious illness of a relative, loved one or child	☐	☐	☐
Spouse or partner left you	☐	☐	☐
Had serious financial problems	☐	☐	☐
Had problems with your children	☐	☐	☐
(**Reservists**) Been concerned you might lose your civilian job	☐	☐	☐

[19] **If you have had any sleep problems IN THE LAST MONTH please can you tell us how you rate them**?

Difficulty falling asleep	None ☐	Mild ☐	Moderate ☐	Severe ☐	Very Severe ☐
Difficulty staying asleep	None ☐	Mild ☐	Moderate ☐	Severe ☐	Very Severe ☐

How satisfied or dissatisfied are you with your current sleep pattern?	Very Satisfied ☐	Satisfied ☐	Dissatisfied ☐	Very Dissatisfied ☐

If you have a sleep problem, does it **INTERFERE** with your daily functioning? (e.g. tiredness, operational duties, memory etc.)	Not at all ☐	A little bit ☐	Somewhat ☐	Quite a bit ☐	Extremely ☐

YOUR UNIT

[20] **How much do you agree or disagree with the following statements?**

During THIS DEPLOYMENT:	**Strongly Agree**	**Agree**	**Disagree**	**Strongly Disagree**
I feel a sense of comradeship (or closeness) between myself and other people in my unit	☐	☐	☐	☐
I am able to go to most people in my unit when I have a personal problem	☐	☐	☐	☐
My seniors are interested in what I do or think	☐	☐	☐	☐
I feel well informed about what is going on in my unit	☐	☐	☐	☐

[21] **During THIS DEPLOYMENT my Commanders do the following:**

	Never	**Seldom**	**Sometimes**	**Often**	**Always**
Embarrass juniors in front of other unit members	☐	☐	☐	☐	☐
Accept extra duties or tasks for the unit in order to impress their superiors	☐	☐	☐	☐	☐
Treat all members of the unit fairly	☐	☐	☐	☐	☐
Show concern about the safety of unit members	☐	☐	☐	☐	☐

22**Please indicate how much you agree with the following statements, which relate to life within your unit during THIS DEPLOYMENT:**

	Strongly Agree	Agree	Disagree	Strongly Disagree
Morale within the unit has generally been high	☐	☐	☐	☐
The unit has been motivated and enthusiastic	☐	☐	☐	☐
The unit has been operating efficiently	☐	☐	☐	☐
I have felt good about being part of this unit	☐	☐	☐	☐

23**Did you receive a stress brief prior to THIS DEPLOYMENT?**

Yes ☐ No ☐

24**Did you take a period of R&R OUTSIDE OF AFGHANISTAN during this deployment?**

Yes ☐ No ☐

25**If you did take R&R, did you find this useful?**

Yes a Lot ☐ A Little ☐ No ☐ Did Not Take R&R ☐

26**Did you take more than one period of R&R at home during this deployment?**

Yes ☐ No ☐

27**For the longest period of R&R that you took, how many days did you spend at home or in your R&R location?**

7 days or less ☐

8 days or more ☐

HEALTH SECTION

28**During THIS DEPLOYMENT, how would you rate your health?**

Excellent ☐ Very Good ☐ Good ☐ Fair ☐ Poor ☐

29**How many times have you reported sick during THIS DEPLOYMENT?**

0 ☐

1 ☐

2-4 ☐

5+ ☐

30 **These questions ask about your General Health**

Within the LAST FEW WEEKS, how often have you:

Been able to concentrate on whatever you're doing?	Better than usual ☐	Same as usual ☐	Worse than usual ☐	Much worse than usual ☐
Lost much sleep over worry?	Not at all ☐	No more than usual ☐	Rather more than usual ☐	Much more than usual ☐
Felt that you were playing a useful part in things?	More so than usual ☐	Same as usual ☐	Less useful than usual ☐	Much less than usual ☐
Felt capable of making decisions about things?	More so than usual ☐	Same as usual ☐	Less useful than usual ☐	Much less capable ☐
Felt constantly under strain?	Not at all ☐	No more than usual ☐	Rather more than usual ☐	Much more than usual ☐
Felt that you couldn't overcome your difficulties?	Not at all ☐	No more than usual ☐	Rather more than usual ☐	Much more than usual ☐
Been able to enjoy your normal day to day activities?	More so than usual ☐	Same as usual ☐	Less so than usual ☐	Much less than usual ☐
Been able to face up to your problems?	Not at all ☐	Same as usual ☐	Less able than usual ☐	Much less able ☐
Been feeling unhappy or depressed?	Not at all ☐	No more than usual ☐	Rather more than usual ☐	Much more than usual ☐
Been losing confidence in yourself?	Not at all ☐	No more than usual ☐	Rather more than usual ☐	Much more than usual ☐
Been thinking of yourself as a worthless person?	Not at all ☐	No more than usual ☐	Rather more than usual ☐	Much more than usual ☐
Been feeling reasonably happy all things considered?	More so than usual ☐	About the same as usual ☐	Less so than usual ☐	Much less than usual ☐

31**STRESSFUL EVENTS - Here is a list of problems and complaints that people sometimes have in relation to having experienced dangerous, stressful or horrific traumatic experiences. How much have you been bothered by these problems in the PAST MONTH?**

	Not at all	A little bit	Moderately	Quite a bit	Extremely
Repeated, disturbing memories, thoughts or images of a stressful experience?	☐	☐	☐	☐	☐
Repeated, disturbing dreams of a stressful experience?	☐	☐	☐	☐	☐
Suddenly acting or feeling as if a stressful experience were happening again (as if you were re-living it)?	☐	☐	☐	☐	☐
Feeling very upset when something reminded you of a stressful experience?	☐	☐	☐	☐	☐
Having physical reactions (e.g. heart pounding, trouble breathing, sweating) when something reminded you of a stressful experience?	☐	☐	☐	☐	☐
Avoiding thinking about or talking about a stressful experience?	☐	☐	☐	☐	☐
Avoiding activities or situations because they reminded you of a stressful experience?	☐	☐	☐	☐	☐
Trouble remembering important parts of a stressful experience?	☐	☐	☐	☐	☐
Loss of interest in activities that you used to enjoy?	☐	☐	☐	☐	☐
Feeling distant or cut off from other people?	☐	☐	☐	☐	☐
Feeling emotionally numb or being unable to have loving feelings to those who are close to you?	☐	☐	☐	☐	☐
Feeling as if your future will somehow be cut short?	☐	☐	☐	☐	☐
Having trouble falling or staying asleep?	☐	☐	☐	☐	☐
Feeling irritable or having angry outbursts?	☐	☐	☐	☐	☐
Having difficulty concentrating?	☐	☐	☐	☐	☐
Being super alert, watchful or on-guard?	☐	☐	☐	☐	☐
Feeling jumpy or easily startled?	☐	☐	☐	☐	☐

32If you experienced any of the problems listed above, how DIFFICULT have these problems made it for you to do your work, take care of things or get along with other people?

Not difficult at all	Somewhat difficult	Very difficult	Extremely difficult	I have no problems
☐	☐	☐	☐	☐

33During THIS DEPLOYMENT how many days have you not been available for full duty because of illness?

0	☐
1	☐
2-4	☐
5-9	☐
10+	☐

34Have you been admitted to the Field Hospital during THIS DEPLOYMENT?

Yes	No
☐	☐

35During THIS DEPLOYMENT, have you had any injuries from any of the following?

Fragment	☐	Blast	☐
Round	☐	Vehicle Accident	☐
A Fall	☐	Other	☐

If other, please specify

36Did these injuries result in any of the following? (Please mark all that apply)

Being dazed, confused or seeing stars	☐	Concussion (e.g. headache, dizziness)	☐
Not remembering the injury	☐	Head Injury	☐
Losing consciousness (knocked out)	☐	None of these	☐

37If you were knocked out, for how long (approximately)?

Less than 5 Mins	6-30 Mins	31 Mins – 1 Hour	1 Hour to 1 Day	More than 1 Day
☐	☐	☐	☐	☐

38**Were you wearing a helmet at the time?**

Yes	No
☐	☐

39**ON THIS DEPLOYMENT have you been medically examined following a head injury?**

Yes	No
☐	☐

IEDs

40**During this deployment how concerned have you been that you might be involved in an IED incident?**

Slightly Concerned	Somewhat Concerned	Very Concerned
☐	☐	☐

41**Have you been involved in an incident where you have been exposed to an exploding IED?**

Never	Once	2-4 Times	5-9 Times	10+ Times
☐	☐	☐	☐	☐

42**If so, what type of IED was it?**

Suicide	☐
Pressure Plate	☐
Command Wire	☐
Remote Control	☐
Unknown	☐

43**Have you been in the point position during a foot patrol or in the point vehicle during Counter IED drills?**

Never	Once	2-4 Times	5-9 Times	10+ Times
☐	☐	☐	☐	☐

44**Have you ever been in point position during IED drills and missed a device which subsequently seriously injured or killed someone?**

Yes	No
☐	☐

45**Have you been involved in a friendly forces IED casualty incident?**

Yes	No
☐	☐

HEALTH AND WELL-BEING

46**During THIS DEPLOYMENT, have you experienced a significant stressful, emotional or family problem?**

Yes ☐ No ☐

47**During THIS DEPLOYMENT, have you received any help for a significant stressful, emotional or family problem at any time?**

Yes ☐ No ☐

48**Who did you receive this help from?**

TRiMmed

A Friend	☐
Unit Chain of Command (excluding the Medic)	☐
TRiM Practitioner	☐
Other Medical Staff (Nurses/MA/CMT)	☐
Regimental Medical Officer or Doctor	☐
Chaplain	☐
Mental Health Professional	☐

TRiM

48a**DURING THIS TOUR, I have been or interviewed by a TRiM interviewer?**

Yes ☐ No ☐

48b**If yes, did TRiM lead to you seeing a medic, mental health professional or chaplain?**

Yes ☐ No ☐

49**Would you CURRENTLY be interested in receiving help for a stressful, emotional or family problem?**

Yes ☐ No ☐

50**Here is a list of concerns that you might have when considering seeking help for a stressful, emotional, mental health or family problem. Please rate each of the possible concerns that might affect <u>YOUR</u> decision to receive help.**

	Strongly Disagree	Disagree	Agree	Strongly Agree
I don't know where to get help	☐	☐	☐	☐
People with mental illness should not be given any responsibility	☐	☐	☐	☐
There would be difficulty getting time away from being on duty for an appointment	☐	☐	☐	☐
It would be too embarrassing	☐	☐	☐	☐
It would harm my career	☐	☐	☐	☐
Members of my unit might have less confidence in me	☐	☐	☐	☐
My unit leaders might treat me differently	☐	☐	☐	☐
I would be seen as weak (by those who are important to me)	☐	☐	☐	☐
I don't trust mental health professionals	☐	☐	☐	☐
My visit would not remain confidential	☐	☐	☐	☐
I would think less of a team member if I knew he/she was receiving mental health treatment	☐	☐	☐	☐
My leaders discourage the use of mental health services	☐	☐	☐	☐
I have had previous bad experiences with mental health professionals	☐	☐	☐	☐

<u>FAMILY</u>

51**How long have you been with your current spouse or long term partner?**

☐ **Not Applicable (please go to question 58 about family support)**

Up to 1 year ☐

2-4 years ☐

5+ years ☐

52**Is your spouse or long term partner in the military?**

Yes ☐ No ☐

53**If yes, are they currently deployed?**

Yes	No
☐	☐

54**How satisfied are you with your marriage or long term partnership?**

Extremely Satisfied	☐
Satisfied	☐
Dissatisfied	☐
Extremely Dissatisfied	☐
Not Applicable	☐

55**Are you currently planning divorce or separation?**

Yes	No
☐	☐

56**Is your spouse or long term partner planning divorce or separation?**

Yes	No
☐	☐

57**So far, what impact do you think THIS DEPLOYMENT has had on your marriage or relationship?**

No Impact	☐
Positive Impact	☐
Negative Impact	☐
Not Applicable	☐

58**Has the military provided any reassurance or support to your FAMILY (parents, siblings, partner or spouse) whilst you have been on THIS DEPLOYMENT?** *(e.g. phone calls or visits, arranging 'get togethers' with other service families, newsletters etc)*

Yes, it is sufficient	☐
Yes, but it is not sufficient	☐
No	☐

If not sufficient please describe the reasons why not:

59**So far, what impact do you think THIS DEPLOYMENT has had on your children?**

☐ **I have no children (please go to question 60)**

No Impact ☐

Positive Impact

☐

Negative Impact ☐

YOUR CAREER INTENTIONS

60**Which best describes your CURRENT career intentions? (Select one option)**

I plan to stay in for as long as possible or until retirement	☐
I plan to extend my present term of service but not necessarily until retirement	☐
I plan to leave on completion of my current term of service	☐
I have already handed in my notice/Premature Voluntary Release (PVR)	☐
I am going to hand in my notice/PVR in the very near future	☐
I have recently withdrawn my notice/PVR	☐

61**Please indicate how much you DISAGREE or AGREE with the following statements about THIS DEPLOYMENT so far:**

	Strongly Disagree	Disagree	Agree	Strongly Agree
It has had a positive effect on my life	☐	☐	☐	☐
I deal with stress better because of this deployment	☐	☐	☐	☐
I feel pride from my accomplishments during this deployment	☐	☐	☐	☐
This deployment has made me more confident in my abilities	☐	☐	☐	☐
This deployment improved cohesion in my unit	☐	☐	☐	☐
I am confident that I will return home healthy after this deployment	☐	☐	☐	☐

We may wish to contact you later. We will NEVER use your information for non-research purposes and no one outside the research team will EVER be told about your answers or given your contact details.

I want to be contacted at a later date:

Yes	No
☐	☐

SIGNATURE:……..……DATE:…...……

End of the Survey, thank you for your help